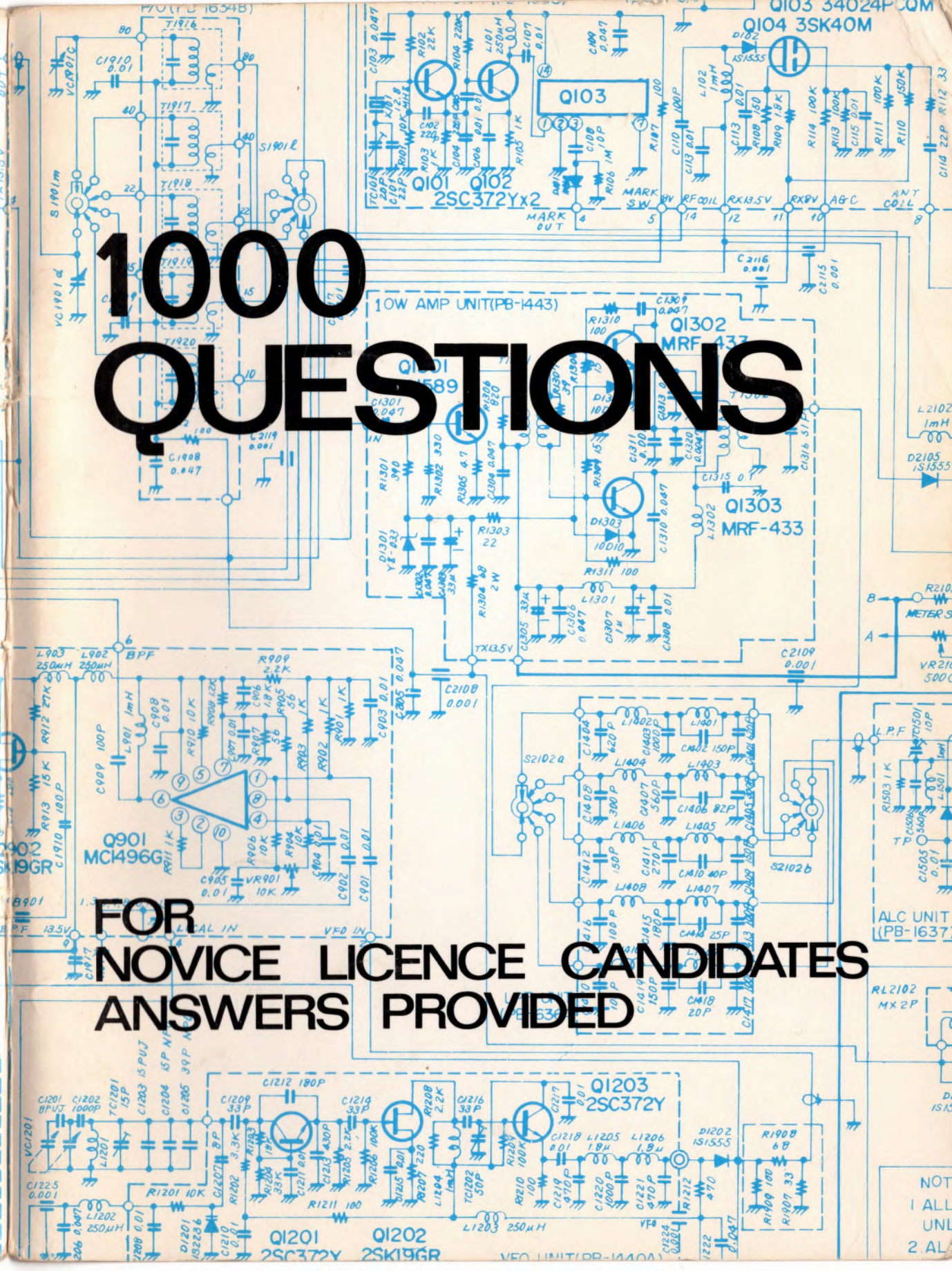
1000
QUESTIONS
FOR
NOVICE LICENCE CANDIDATES
ANSWERS PROVIDED

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

A set of Theory and Regulation questions to aid students preparing for the Novice Amateur Operator's Certificate of Proficiency Examinations

compiled

by

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1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

PREFACE

The text "1000 Questions for Novice Licence Candidates" was originally produced to meet a need for the testing of a candidate's weak points and to give practice in answering multi-choice type questions.

Since publication of the first edition in 1977 the Postal and Telecommunications Department has approved an official Novice Syllabus and a bank of questions now exists, from which exam material may be drawn. Questions in this book have now been rearranged to correspond with the syllabus, topic for topic, and more than half the questions from the original text have been replaced. While it is unlikely that the questions in this book will appear in the official exam we have attempted to duplicate the style and difficulty of examination questions.

This book has been produced by Radio Amateurs who volunteered their time on behalf of the Wireless Institute of Australia, New South Wales Division.

USING THE BOOK

This book is designed to be used in conjunction with a Novice text book or Study Guide. It should be used to revise and test sections of work after they have been studied. Clearly there is no value in attempting to simply memorise the answers to these questions.

Where possible try to discuss poorly understood questions with an Amateur or your instructor. Remember to attempt multi-choice questions by eliminating wrong alternatives. You should know why any given alternative is suitable or unsuitable.

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ELECTRICAL LAWS AND CIRCUITS

ELECTRICITY AND ELECTRIC CIRCUITS

1. A substance has electrons which are free to drift freely from atom to atom. Such a substance is likely to be:

   a. copper. b. a vacuum. c. air. d. glass.

2. Which of the following is meant by the abbreviation EMF?

   a. electrical mains frequency
   b. electric measuring force
   c. electro magnetic force
   d. electro motive force

3. The best conductor listed below is:

   a. copper. b. carbon. c. glass. d. a vacuum.

4. An important use of insulators in electronics is:

   a. electrodes in radio valves.
   b. electrolytes in lead-acid cells.
   c. dielectric material in capacitors.
   d. wire leads on transistors.

5. An electrical component marked as "6.8 kilohms" would be a:

   a. capacitor. b. transistor. c. dry cell. d. resistor.

6. The opposition to electron flow in a circuit would be called:

   a. current. b. voltage. c. resistance. d. power.

7. Between two points in a circuit the potential difference would be measured in:

   a. amperes. b. volts. c. ohms. d. coulombs.

8. Which of the following instruments is used for measuring electrical current flow?

   a. wattmeter b. voltmeter c. ammeter d. faradmeter

9. The substance listed which will most readily allow an electric current to flow is called:

   a. an insulator. b. a conductor. c. a resistor. d. a dielectric.

10. The ohm is the unit of:

    a. supply voltage.
    b. electrical pressure.
    c. current flow.
    d. electrical resistance.

11. Which of the following devices depends on electromagnetism for its operation?

    a. lead-acid cell
    b. solenoid relay
    c. electrolytic capacitor
    d. field effect transistor

12. A length of metal is connected in a circuit and is found to conduct electricity very well. It would be best described as having a:

    a. high resistance. b. low resistance. c. high wattage. d. low wattage.

13. The plastic coating formed around wires is used as:

    a. an insulator. b. a conductor. c. an inductor. d. a magnet.

14. The most common material used as a resistor is:

    a. lead. b. gold. c. mica. d. carbon.

15. The unit of current flow is the:

    a. volt. b. ohm. c. ampere. d. farad.

16. The space in which substances experience a magnetic force is called:

a. magnetic field.
b. an electric field.
c. an electronic field.
d. a gravitational field.

17. A kilohm refers to:

a. 10 ohms.
b. 0.1 ohms.
c. 0.001 ohms.
d. 1 000 ohms.

18. 6.6 kilovolts is equal to:

a. 66 volts.
b. 660 volts.
c. 6 600 volts.
d. 66 000 volts.

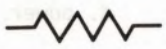
19. A current of one quarter of an ampere may be written as:

a. 250 microamperes.
b. 0.5 amperes.
c. 0.25 milliamperes.
d. 250 milliamperes.

20. How many millivolts are equivalent to two volts?

a. 0.002
b. 2 000
c. 0.000 002
d. 2 000 000

21. This circuit symbol represents:



a. a capacitor.
b. a resistor.
c. an inductor.
d. an aerial.

22. In the resistor colour code the third colour band indicates:

a. tolerance range.
b. power value.
c. the multiplier.
d. resistor material.

23. In the resistor colour code the colour yellow refers to the number:

a. 2.
b. 3.
c. 4.
d. 5.

24. A resistor is marked with the colours red-violet-yellow. This resistor has a value in ohms of:

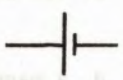
a. 274.
b. 270 k.
c. 72 k.
d. 27 M.

25. A device which is magnetic only when the current is flowing is called:

a. a magnetic field.
b. an electromagnet.
c. a bar magnet.
d. a permanent magnet.

DIRECT CURRENT

1. This symbol represents a:



a. cell.
b. resistor.
c. transistor.
d. coil.

2. A cell that can be repeatedly recharged by supplying it with electrical energy is known as a:

a. primary cell.
b. secondary cell.
c. yagi cell.
d. low leakage cell.

3. Which of the following is a source of EMF?

a. lead acid battery
b. carbon resistor
c. germanium diode
d. P channel FET

4. An important difference between a normal torch cell and a lead acid car battery is that only the lead acid battery:

a. has two terminals.
b. contains an electrolyte.
c. can be repeatedly recharged.
d. can be effectively discharged.

5. When an electric cell is connected to an electric circuit:

a. electrons flow from the positive electrode into the circuit.
b. electrons flow from the negative electrode into the circuit.
c. atoms flow from the positive electrode into the circuit.
d. atoms flow from the negative electrode into the circuit.

6. All Leclanche cells have a nominal voltage of 1½ volts. Compared with a small cell of this type, a large cell would have:

a. different chemicals inside the case.
b. a longer life supplying the same current.
c. the ability to be recharged.
d. a greater open circuit voltage.

7. A dry cell has an open circuit voltage of 1.5 volts. When supplying a great deal of current the voltage may drop to 1.2 volts. This is due to the cell's:

a. internal resistance.
b. self capacitance.
c. electrolyte leaking.
d. SWR effect.

8. This is a circuit symbol for:

a. a battery.
b. an inductor.
c. a resistor.
d. a cell.

9. The basic torch cell has an EMF of 1.5 volts. Which of the following is likely to be a battery formed from these cells?

a. 1 volt battery. b. 2 volt battery. c. 3 volt battery. d. 4 volt battery.

10. What is the smallest number of 1½ volt cells you need to produce a 9 volt battery?

a. 3 b. 6 c. 9 d. 12

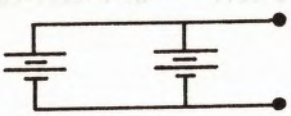
11. To make a long lasting 1½ volt battery from three 1½ volt cells, the cells should be connected in:

a. series resonant. b. series. c. parallel resonant. d. parallel.

12. Six dry cells are connected to provide a battery for a 9 volt transistor radio. The cells are connected in:

a. parallel resonant. b. parallel. c. series resonant. d. series.

13. The diagram shows a battery formed from:



a. 1 cell.
b. 2 cells.
c. 4 cells.
d. 8 cells.

14. A lead-acid battery should have its top casing and terminals kept clean to prevent:

a. excess battery voltage developing.
b. corrosion of terminals and leads.
c. overcharging occurring.
d. excessive capacitance effects.

15. A battery is made of six lead-acid cells in parallel. It will have an effective voltage of:

a. 2 volts. b. 6 volts. c. 9 volts. d. 12 volts.

16. The nominal output voltage of a single lead-acid cell is:

a. 1.2 volts. b. 1.5 volts. c. 2.0 volts. d. 6.0 volts.

17. A battery is made of six lead-acid cells in series. It will have an effective voltage of:

a. 2 volts. b. 6 volts. c. 9 volts. d. 12 volts.

18. No flames should be brought near a lead-acid cell being charged because of the:

a. corrosive sulphuric acid. b. high charging currents.
c. hydrogen gas produced. d. inflammable plastic case.

19. The state of charge of a storage cell can be conveniently found by examining the:

a. acid content of electrolyte. b. lead content of the electrode.
c. corrosion on the terminals. d. leakage current of the cell.

20. A lead-acid battery will begin to charge when the:

a. terminal voltage of charger exceeds battery voltage.
b. terminal voltage of battery exceeds charging voltage.
c. internal resistance of the battery is high.
d. internal resistance of the battery is low.

21. Regular maintenance of lead-acid cells should involve:

a. adding lead to electrolyte. b. completely discharging each cell.
c. depolarising the cells. d. maintaining electrolyte levels.

22. To limit the current drawn when charging a lead-acid cell you would:

a. connect a resistor in series. b. connect a resistor in parallel.
c. connect a capacitor in series. d. connect a capacitor in parallel.

23. The liquid from lead-acid cells should not be allowed to come in contact with clothing or sensitive skin because this liquid is:

a. expensive to replace. b. charged with electricity.
c. highly inflammable. d. corrosive and poisonous.

24. The voltage of a new Leclanche type torch cell is:

a. 0.5 volts. b. 1.2 volts. c. 1.5 volts. d. 2.0 volts.

25. A Nicad cell is really a shortened name for the:

a. nichrome cell. b. Leclanche cell. c. lead-acid cell. d. nickel-cadmium cell.

26. Sealed Nicad cells should not be charged at high current rates because they:

a. might explode due to sudden gas pressure.
b. may reverse polarity because of high current.
c. convert their electrolyte to water.
d. may convert to a Leclanche cell.

27. A Nicad cell has a typical no load output voltage of:

a. 1 volt. b. 1.2 volts. c. 1.5 volts. d. 2 volts.

28. The voltage across a resistor carrying current is:

a. I + R. b. I - R. c. I X R. d. $\frac{I}{R}$.

29. A current of 2 amperes flows through a resistance of 16 ohms. The applied voltage is:

a. 8 volts. b. 14 volts. c. 18 volts. d. 32 volts.

30. What voltage causes a current of 5 ampere to flow in a resistance of 50 ohms?

a. 20 volts. b. 45 volts. c. 55 volts. d. 250 volts.

31. What voltage would be needed to supply a current of 200 mA to operate an electric lamp which has a resistance of 25 ohms?

a. 5 volts. b. 8 volts. c. 175 volts. d. 225 volts.

32. An EMF of 6 volts causes a current of 0.5 ampere to flow through a resistance. To change the current to 0.25 ampere the voltage must:

a. increase to 12 volts. b. drop to 3 volts.
c. not change. d. drop to zero.

33. The current flowing through a resistor is:

a. E X R. b. $\frac{E}{R}$. c. E + R. d. E − R.

34. When an 8 ohm resistor is connected to a 12 volt supply the current flow in amperes is:

a. $\frac{12}{8}$. b. $\frac{8}{12}$. c. 12 − 8. d. 12 + 8.

35. A circuit has a total resistance of 100 ohms. When a voltage of 50 volts is applied to the circuit the current which will flow will be:

a. 50 mA. b. 500 mA. c. 2 amperes. d. 20 amperes.

36. Which of the following resistors has the greatest opposition to current flow?

a. 230 ohm b. 1.2 kilohm c. 1 600 ohm d. 0.5 megohm

37. The resistance of a circuit can be found by:

a. E + I. b. E − I. c. $\frac{E}{I}$. d. E X I.

38. A resistor in a circuit has a voltage across its ends of 10 volts. While carrying a current of 1 mA the resistance must be:

a. 10 ohms. b. 100 ohms. c. 1 kilohm. d. 10 kilohm.

39. A torch bulb is connected to a 3 volt battery. If 300 mA flows the resistance of the bulb is:

a. 10 ohms. b. 9 ohms. c. 6 volts. d. 3 volts.

40. An EMF of 12 volts causes a current of 0.5 ampere to flow through a resistor. The value of its resistance is:

a. 6 ohms. b. 12,5 ohms. c. 17 ohms. d. 24 ohms.

41. This circuit would be best described as a:

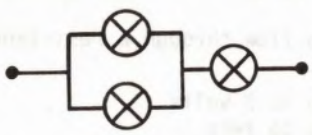
a. series circuit.
b. parallel circuit.
c. series-parallel circuit.
d. series resonant circuit.

42. Which of the following formulae would be correct for finding the total series resistance?

a. $R_t = R_1 \times R_2 \times R_3$ b. $R_t = R_1 + R_2 + R_3$

c. $R_t = \frac{R_1 + R_2 + R_3}{3}$ d. $R_t = \frac{R_1 \times R_2 \times R_3}{3}$

43. The diagram shows three light bulbs in a circuit. The bulbs are wired in:



a. series.
b. parallel.
c. series-parallel.
d. shunt form.

44. A pair of stereo headphones has separately connected earpieces each of 8 ohms. When connected in series they should present a load of:

a. 2 ohms. b. 4 ohms. c. 8 ohms. d. 16 ohms.

45. When resistors are arranged in series it is true to say that their total resistance is:

a. less than the resistance of any one resistor.
b. greater than the resistance of any one resistor.
c. equal to the highest resistance present.
d. equal to the lowest resistance present.

46. What is the combined resistance of five 10 ohm resistors in series?

a. 1 ohm b. 5 ohms c. 10 ohms d. 50 ohms

47. If the resistors 10, 270, 3 900, and 100 ohms are connected in series the total resistance would be:

a. 9 ohms. b. 3 900 ohms. c. 4 280 ohms. d. 10 ohms.

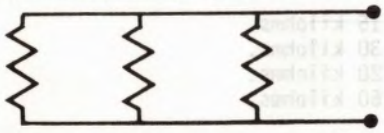
48. Which series combination of resistors would most nearly replace a single 120 ohm resistor?

a. five 33 ohm b. six 22 ohm c. two 68 ohm d. five 100 ohm

49. If two resistors of 0.22 Megohm and 330 kilohm are arranged in series the total resistance is:

a. 55 000 ohms. b. 550 Megohms.
c. 55 000 kilohms. d. 550 kilohms.

50. This circuit shows three resistors arranged in:



a. series.
b. parallel.
c. series-parallel.
d. potential divider.

51. If ten resistors all "R" ohms were wired in parallel then the total resistance would be:

a. 10 x R. b. 10 + R. c. $\frac{10}{R}$. D. $\frac{R}{10}$.

52. What is the total resistance of four 68 ohm resistors wired in parallel?

a. 12 ohms b. 17 ohms c. 34 ohms d. 272 ohms

53. The resistors 68 ohm, 47 kilohms, 560 ohms and 10 ohms are connected in parallel. The total resistance is:

a. less than 10 ohms. b. between 68 and 560 ohms.
c. between 560 ohms and 47 kilohms. d. greater than 47 kilohms.

54. Which of the following resistor combinations would most nearly replace a single 150 ohm resistor?

a. four 47 ohm resistors in parallel b. five 33 ohm resistors in parallel
c. four 47 ohm resistors in series d. five 33 ohm resistors in series

55. Two 120 ohm resistors are arranged in parallel to replace a faulty resistor. The faulty resistor originally had a value of:

a. 15 ohms. b. 30 ohms. c. 60 ohms. d. 120 ohms.

56. Two resistors are in parallel. If resistor A carries twice the current that resistor B does then it means that:

a. A has half the resistance of B.
b. B has half the resistance of A.
c. the voltage across A is twice that across B.
d. the voltage across B is twice that across A.

57. Given five 1 kilohm resistors the least resistance that can be made would be:

a. 50 ohms by arranging them in series.
b. 50 ohms by arranging them in parallel.
c. 200 ohms by arranging them in series.
d. 200 ohms by arranging them in parallel.

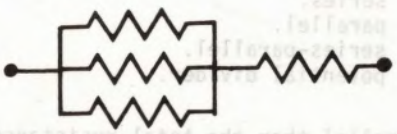
58. Which of the following combinations of 28 ohm resistors would have a total resistance of 42 ohms?

a. three resistors in series
b. three resistors in parallel
c. two resistors in parallel in series with another
d. two resistors in parallel in series with another two in parallel

59. Two 100 ohm resistors arranged in parallel are wired in series with a 10 ohm resistor. The total resistance is:

a. 60 ohms. b. 180 ohms. c. 190 ohms. d. 210 ohms.

60. Four 15 kilohm resistors are wired as shown. The total resistance is:



a. 15 kilohms.
b. 30 kilohms.
c. 20 kilohms.
d. 60 kilohms.

61. A 5 ohm and a 10 ohm resistor are wired in series and connected to a 30 volt power supply. The current flow from the power supply is:

a. 0.5 ampere. b. 1 ampere. c. 2 ampere. d. 15 ampere.

62. Three 12 ohm resistors are wired in parallel and connected to an 8 volt supply. The total current flowing from the 8 volt supply is:

a. 1 ampere. b. 2 ampere. c. 3 ampere. d. 4.5 ampere.

63. Two 33 ohm resistors are connected in series with a power supply. If the current flow is 100 mA then the voltage across one resistor is:

a. 66 volts. b. 33 volts. c. 3.3 volts. d. 1 volt.

64. Three resistors of 3.3, 4.7 and 10 ohms are connected in series across a 36 volt battery. The current flowing through the 10 ohm resistor is:

a. 0.5 ampere. b. 1.0 ampere. c. 2.0 ampere. d. 3.6 ampere.

65. One way of operating a 3 volt bulb from a 9 volt supply would be to:

a. operate it in series with the supply. b. operate it in parallel with the supply.
c. operate it in series with a resistor. d. operate it in parallel with a resistor.

66. How many identical lamps each rated at 250 mA could be operated full current from a 5A supply?

a. 50 lamps b. 30 lamps c. 20 lamps d. 5 lamps

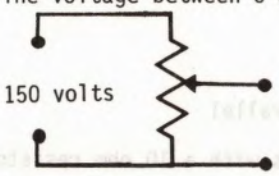
67. A set of three resistors each of 33 ohms wired in parallel is connected to a power supply. If each resistor is carrying 1 ampere the voltage of the power source is:

a. 99 volts. b. 33 volts. c. 11 volts. d. 1 volt.

68. If two resistors of 180 and 820 ohms are connected in series across a 15 volt DC supply the current flow in the circuit is:

a. 15 milliamperes. b. 30 milliamperes. c. 15 amperes. d. 30 amperes.

69. The resistor has a resistance of 66 ohms while the resistance between J & K is 22 ohms. The voltage between J & K would be:



a. 450 volts.
b. 150 volts.
c. 100 volts.
d. 50 volts.

70. If six identical bulbs each rated at 2 volts were connected in series the supply voltage needed to cause the bulbs to light normally would be:

a. 3 V. b. 12 V. c. 6 V. d. 2 V.

71. How many 12 volt bulbs should be arranged in series to form a string of lights to operate from a 240 volt power supply?

a. 12 x 240 b. 240 + 12 c. 240 − 12 d. 240 ÷ 12

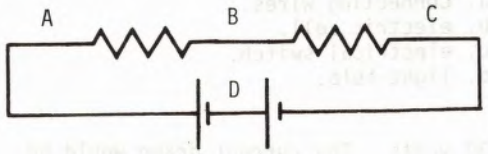
72. Often in the small decorative lights used on Xmas trees, if one bulb is removed the rest will fail to light. This would indicate that:

a. removing one bulb causes the others to blow.
b. only that bulb was satisfactory.
c. the bulbs are arranged in parallel.
d. the bulbs are arranged in series.

73. Three 10 000 ohm resistors are connected in series across a 90 volt DC power supply. The voltage drop across one of the resistors is:

a. 30 volts. b. 60 volts. c. 90 volts. d. 15.8 volts.

74. The current in this circuit will be the same at:



a. A and B.
b. B and C.
c. A, B and C.
d. A, B, C and D.

75. Two resistors of the same value, are arranged in a series circuit with a battery. It is true to say that:

	Voltage across each resistor	Current in each resistor
a.	same	same
b.	same	different
c.	different	same
d.	different	different

76. A 100 ohm resistor is connected across the terminals of a 3 volt battery. To double the current flowing in the circuit it is necessary to add a:

a. 100 ohm resistor in series.
b. 50 ohm resistor in series.
c. 100 ohm resistor in parallel.
d. 50 ohm resistor in parallel.

77. Power is expressed in:

a. ohms. b. watts. c. amperes. d. volts.

78. Which of the following two quantities should be multiplied together to find power:

a. resistance and capacitance. b. voltage and current.
c. voltage and inductance. c. inductance and capacitance.

79. Which two electrical units multiply together to give the unit "watts"?

a. volts and amperes. b. volts and farads.
c. farads and henrys. d. amperes and henrys.

80. A resistor is rated at 2 watts. This means the resistor:

a. needs 2 watts to operate correctly. b. can safely dissipate 2 watts of power.
c. will limit the power to 2 watts. d. has a resistance of 2 watts.

81. A resistor in a circuit becomes very hot and starts to burn. This is because the resistor is dissipating too much:

a. current. b. voltage. c. resistance. d. electrical power.

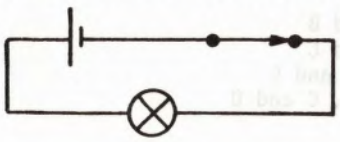
82. High power resistors are usually large with heavy leads. The size aids the operation of the resistor by:

a. allowing higher voltage to be handled.
b. making it shock proof.
c. increasing the effective resistance of the resistor.
d. allowing heat to dissipate more readily.

83. The resistor that would dissipate most heat would be marked:

a. 20 watts. b. 0.5 watts. c. 2 ohms. d. 10 ohms.

84. In this circuit most electrical energy would be converted to heat and light energy in:



a. connecting wires.
b. electric cell.
c. electrical switch.
d. light bulb.

85. A 12 volt light bulb is rated at a power of 30 watts. The current drawn would be:

a. 360 amperes. b. 18 amperes. c. $\frac{30}{12}$ amperes. d. $\frac{12}{30}$ amperes.

86. The minimum power rating of a resistor passing 10 mA at 10 volts PD would need to be:

a. 0.01 watt. b. 0.1 watt. c. 1 watt. d. 10 watt.

87. If two resistors each of 10 ohms are connected in series with a battery of 10 volts then the power consumption would be:

a. 5 watts. b. 10 watts. c. 20 watts. d. 100 watts.

88. Each of 9 resistors in a circuit is dissipating 4 watts. If the circuit operates from a 12 volt supply the total current flowing in the circuit is:

a. 48 amperes. b. 36 amperes. c. 9 amperes. d. 3 amperes.

89. A power supply of 25 volts DC is supplying five 10 ohms resistors in series. The power rating of each resistor needs to be at least:

a. 1 watt. b. 2 watts. c. 3 watts. d. 4 watts.

90. Three 18 ohm resistors are connected in parallel across a 12 volt DC supply. The total power dissipation of the resistors is:

a. 3 watts. b. 18 watts. c. 24 watts. d. 36 watts.

91. One advantage in replacing a 50 ohm resistor with a parallel combination of two similarly sized 100 ohm resistors is that the parallel combination will have:

a. greater resistance and similar power rating.
b. lesser resistance and similar power rating.
c. the same resistance but greater power rating.
d. the same resistance but lesser power rating.

92. Voltage and current readings are given for various resistors in a circuit. Which resistor will dissipate the most power?

a. 2 volts and 40 mA
b. 1 volt and 1 ampere
c. 250 mA and 250 mV
d. 500 mA and 3 volts

93. A resistor of 10 kilohms has a current of 20 mA flowing through it. The power dissipated in the resistor is:

a. 2 watts.
b. 4 watts.
c. 20 watts.
d. 40 watts.

I^2R OR, $E \times I$

AC CIRCUIT

1. The frequency of a current is 50 hertz. This means:

a. a potential difference of 50 volts exists.
b. the current flow is 50 ampere.
c. the power dissipated is 50 watts.
d. the current oscillates 50 times per second.

2. Current in an AC circuit goes through a complete cycle in 0.1 second. This means the AC has a frequency of:

a. 1 Hz.
b. 10 Hz.
c. 100 Hz.
d. 1 000 Hz.

3. A signal formed when a 4 kHz sine wave is mixed with signals of 8, 12 and 16 kHz is called a:

a. pure sine wave.
b. single harmonic wave.
c. frequency response curve.
d. complex wave.

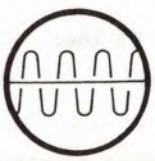
4. A signal is found to be made of a fundamental frequency of 2 kHz and another signal of 4 kHz. This 4 kHz signal is referred to as:

a. a fundamental of the 2 kHz signal.
b. a harmonic of the 2 kHz signal.
c. the DC component of the main signal.
d. a dielectric signal of the main signal.

5. A mixture of many different AC waveforms is termed:

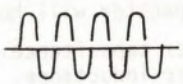
a. a fundamental wave.
b. a harmonic wave.
c. a complex wave.
d. an induced wave.

6. The diagram shows a voltage trace on a cathode ray screen. It represents:



a. direct current.
b. alternating voltage.
c. output of dry cell.
d. output of lead acid cell.

7. The shape shown is often described as a:



a. RMS wave.
b. harmonic wave.
c. sine wave.
d. coupling wave.

8. To generate an AC sine wave two basic components are needed. These are:

a. primary cell and wire.
b. wire coil and magnet.
c. magnet and primary cell.
d. wire coil and a resistor.

9. A useful value which indicates the effective voltage in an AC circuit is the:

a. RMS value. b. peak value. c. surge value. d. clipping value.

10. RMS voltage refers to effective voltage. A correct formula about RMS voltage is:

a. RMS = .707 x peak.
b. RMS = .707 x average.
c. RMS = 1.414 x peak.
d. RMS = 1.414 x average.

11. An AC supply and DC supply are connected to identical bulbs and adjusted until each bulb is equally bright. The DC supply is found to be 6 volts. Thus the AC supply is 6 volts:

a. peak. b. RMS. c. surge. d. peak to peak.

12. An equivalent of "one cycle per second" is one:

a. henry. b. volt. c. hertz. d. coulomb.

13. One megahertz is equal to:

a. 0.001 Hz. b. 100 kHz. c. 1 000 kHz. d. 10 Hz.

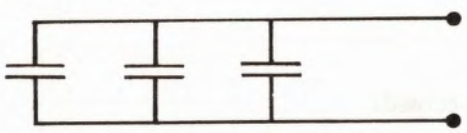
14. A radio component would be identified as a capacitor if its value was measured in:

a. microvolts. b. millihenrys. c. megohms. d. picofarads.

15. A 0.01 µF capacitor is formed from two metal plates separated by air. The capacitor could be changed to 0.02 µF by:

a. bringing the metal plates closer together.
b. making the plates smaller in size.
c. charging the capacitor to a high voltage.
d. touching the two plates together.

16. The circuit shows:



a. three capacitors in series.
b. three capacitors in parallel.
c. three chokes in series.
d. three chokes in parallel.

17. Which of the following is most likely to be a capacitor of 200 µF?

a. a plastic capacitor
b. ceramic capacitor
c. silver mica capacitor
d. electrolytic capacitor

18. The material which separates the plates of a capacitor is the:

a. dielectric. b. nicad. c. resistor. d. lamination.

19. Which of the following factors affects capacitance?

a. thickness of dielectric
b. surrounding magnetic field
c. capacitor working voltage
d. resistance between the plates

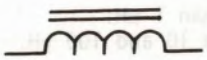
20. Compared to an RF by-pass capacitor an AF by-pass capacitor will have a:

a. larger capacitance.
b. smaller capacitance.
c. larger inductance.
d. smaller inductance.

21. One thousand picofarads means the same as:

a. 0.1 microfarads.
b. 0.01 microfarads.
c. 0.001 microfarads.
d. 0.0001 microfarads.

22. This symbol represents:



a. an aerial.
b. a capacitor.
c. an inductor.
d. a diode.

23. Substances like iron or ferrite are used in inductors since they have high:

a. resistance. b. conductivity. c. permeability. d. capacitance.

24. The inductance of a coil would be increased by:

a. inserting a ferrite rod.
b. removing some turns.
c. inserting a brass core.
d. winding on a thinner former.

25. Another name for an inductor is a:

a. carbon resistor. b. dielectric. c. choke. d. diode.

26. The unit to indicate the value of inductance in a radio component is called the:

a. ohm. b. farad. c. volt. d. henry.

27. A changing magnetic field around a wire coil will cause:

a. A.F. by-passing. b. R.F. by-passing. c. an induced emf. d. an induced capacitance.

28. In some components a changing current causes a changing magnetic field which opposes this change in current. These components would be called:

a. resistors. b. capacitors. c. inductors. d. transistors.

29. An inductance of 10 000 microhenries may be stated correctly as:

a. 10 henrys. b. 100 millihenrys. c. 10 millihenrys. d. 1 000 henrys.

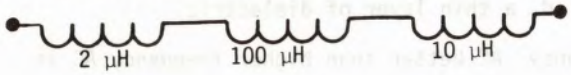
30. A moving coil meter can be easily protected from mechanical damage while being transported by:

a. shorting its terminals.
b. leaving its terminals open circuit.
c. applying a constant voltage.
d. applying a constant current.

31. Four radio chokes each of 12 microhenry are wired in series. The total inductance will be closest to:

a. 3 microhenry b. 4 microhenry c. 12 microhenry d. 48 microhenry

32. The effective inductance of this combination is:



a. more than 100 µH.
b. less than 2 µH.
c. between 2 and 10 µH.
d. between 10 and 100 µH.

33. Two 12 millihenry chokes are wired in parallel. The effective inductance is:

a. 3 millihenry. b. 6 millihenry. c. 12 millihenry. d. 24 millihenry.

34. To replace a faulty 10 millihenry choke you could use two:

a. 5 millihenry chokes in series.
b. 5 millihenry chokes in parallel.
c. 10 millihenry chokes in series.
d. 10 millihenry chokes in parallel.

35. Three inductances 1μH, 10μH and 100μH are wired in parallel. The effective inductance of this combination is:

a. more than 100 μH.
b. less than 1 μH.
c. between 1 and 10 μH.
d. between 10 and 100 μH.

36. Three 15 picofarad capacitors are wired in parallel. The capacitance of the combination is:

a. 45 picofarad. b. 18 picofarad. c. 12 picofarad. d. 5 picofarad.

37. Three 15 microfarad capacitors are wired in series. The capacitance of the combination is:

a. 45 microfarad. b. 18 microfarad. c. 12 microfarad. d. 5 microfarad.

38. Which series combinations of capacitors would best replace a faulty 10 microfarad capacitor?

a. two 10 microfarad capacitors.
b. ten 2 microfarad capacitors.
c. two 20 microfarad capacitors.
d. twenty 2 microfarad capacitors.

39. A parallel combination of 20, 15 and 10 μF capacitors will have a total capacitance of:

a. less than 10 μF.
b. between 10 and 15 μF.
c. between 15 and 20 μF.
d. greater than 20 μF.

40. Both capacitors and inductances can oppose AC. This opposition to AC is referred to as:

a. resistance. b. resonance. c. SWR. d. reactance.

41. In general the reactance of capacitors increases as:

a. AC frequency increases.
b. AC frequency decreases.
c. applied voltage increases.
d. applied voltage decreases.

42. A capacitor acts as an open circuit to 10 Hz AC yet readily passes 10 KHz AC. This indicates that the:

a. dielectric is breaking down.
b. electrostatic shielding is changing.
c. copper losses are occurring.
d. reactance depends on frequency.

43. An air spaced capacitor has a high reactance to an AC signal. This means that the:

a. capacitor will tend to pass the AC.
b. capacitor will tend to block the AC.
c. air will become conductive to the AC.
d. air will act as an insulator to the AC.

44. An audio frequency choke is different from a radio frequency choke in that the audio frequency choke has:

a. few iron laminations or cores.
b. many iron laminations or cores.
c. a great thickness of dielectric.
d. a thin layer of dielectric.

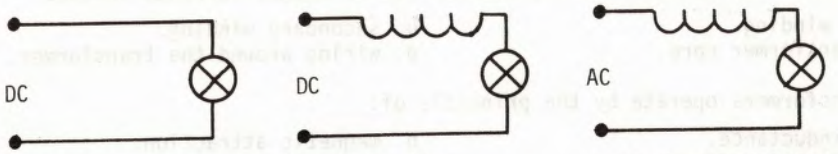
45. A component which tends to pass low frequency AC better than higher frequency AC is:

a. an inductance. b. a capacitor. c. a resistor. d. a transistor.

46. In general the reactance of inductors increases with:

a. decreasing AC frequency.
b. increasing AC frequency.
c. decreasing applied voltage.
d. increasing applied voltage.

47.



bulb lights | bulb lights | bulb does not light

The effect shown in these circuits illustrates that the inductor has a high:

a. AC reactance.
b. DC reactance.
c. AC rectification.
d. DC rectification.

48. A coiled length of wire may readily pass DC yet may oppose AC. This is due to the wire acting as a:

a. capacitor. b. inductor. c. resistor. d. transistor.

49. In inductances AC may be opposed by both resistance of winding wire and reactance due to inductive effect. The term which includes resistance and reactance is:

a. resonance. b. capacitance. c. inductance. d. impedance.

50. A set of audio headphones is labelled "impedance 8 ohms". This impedance is:

a. greater than the resistance.
b. less than the reactance.
c. equal to the resistance.
d. equal to the reactance.

51. This is the symbol for:

a. a capacitor.
b. a microphone.
c. a loudspeaker.
d. an iron cored transformer.

52. Which of the following is a type of loss that usually occurs in power transformers?

a. resonance loss b. copper loss c. frequency loss d. diode loss

53. The fact that energy transfer from primary to secondary winding in a power transformer is not perfect is indicated by:

a. large secondary currents.
b. high primary voltages.
c. warm iron laminations.
d. electrostatic shielding.

54. A transformer when used to power a transistor radio from the mains is being used to:

a. match impedance.
b. reduce the voltage.
c. produce less power.
d. match reactances.

55. An electrostatic screen between windings on a transformer acts to:

a. increase magnetic coupling.
b. increase capacitive coupling.
c. decrease magnetic coupling.
d. decrease capacitive coupling.

56. In a circuit a transformer is shown connecting an amplifier stage to a speaker. This transformer is being used to match:

a. voltages. b. SWR. c. impedances. d. frequencies.

57. The core of a power transformer is usually laminated to:

a. reduce manufacturing cost.
b. reduce transformer weight.
c. reduce heat in transformer.
d. increase the turns ratio.

58. The insulated laminations in a transformer act to reduce currents in the:

a. primary winding.
b. secondary winding.
c. iron transformer core.
d. wiring around the transformer.

59. Power transformers operate by the principle of:

a. mutual inductance.
b. magnetic attraction.
c. piezo electric effect.
d. copper losses.

60. The primary winding of a 240 V mains operated transformer has 720 turns. The secondary number of turns needed for a 20 volt output is:

a. 20.
b. 60.
c. 240.
d. 720.

61. A transformer operates a 6.3 volt 2 ampere light bulb from its secondary winding. The power consumed by the primary is approximately:

a. 3 watts.
b. 6 watts.
c. 8 watts.
d. 13 watts.

62. A transformer has a 240 volt primary that draws a current of 250 mA from the mains supply. Assuming no losses, what current would be available from a 12 volt secondary?

a. 215 amperes
b. 5 amperes
c. 25 amperes
d. 50 amperes

63. On a mains power transformer the primary winding has 250 turns and the secondary has 500. If the input voltage is 240 volts the likely secondary voltage is:

a. 24
b. 120
c. 480
d. 500

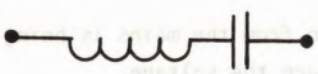
64. A tuned circuit is formed from two basic components. These are:

a. diodes and transistors.
b. resistors and valves.
c. directors and reflectors.
d. inductors and capacitors.

65. The resonant frequency of this circuit depends on:

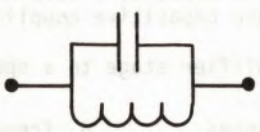
a. frequency of applied signal.
b. capacitor value only.
c. inductor value only.
d. capacitor and inductor value.

66. This is a:



a. series rectifier circuit.
b. series resonant circuit.
c. parallel rectifier circuit.
d. parallel resonant circuit.

67. This is a:



a. series rectifier circuit.
b. series resonant circuit.
c. parallel rectifier circuit.
d. parallel resonant circuit.

68. When a parallel coil-capacitor combination is supplied with AC of different frequencies there will be one frequency where the impedance is highest. This is termed the:

a. reactive frequency.
b. impedance frequency.
c. inductive frequency.
d. resonant frequency.

69. In a parallel resonant circuit at resonance the circuit has a:

a. low impedance..
b. high impedance.
c. low mutual inductance.
d. high mutual inductance.

70. In a series resonant circuit at resonance the circuit has a:

a. low impedance.
b. high impedance.
c. low mutual inductance.
d. high mutual inductance.

71. A coil and air-spaced capacitor are arranged to form a resonant circuit. The resonant frequency will remain the same if we:

a. wind more turns on the coil.
b. increase the area of plates in capacitor.
c. replace the air with oil in the capacitor.
d. add a resistor to the circuit

72. Resonant circuits are frequently used in receivers since they form a circuit which changes impedance with changes in applied:

a. current direction.
b. voltage level.
c. signal frequency.
d. standing wave ratio.

73. Piezo electric effects are used in:

a. magnetic earphones.
b. crystal microphones.
c. series resistance circuits.
d. parallel resistance circuits.

74. Piezo electricity is generated by:

a. touching crystals with magnets.
b. moving a magnet near a wire coil.
c. inserting metal rods into acid.
d. deforming certain crystals.

75. The operation of crystal microphones depends on the:

a. mutual induction effect.
b. piezo electric effect.
c. parallel resonance effect.
d. decibel effect.

76. The unit "decibel""is used to indicate:

a. certain radio waves.
b. single side band signal.
c. cathode ray wave forms.
d. mathematical ratios.

77. The power output from a transmitter increases from 1 watt to 2 watt. This is a db increase of:

a. 1 db. b. 3 db. c. 10 db. d. 30 db.

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

THE THERMIONIC VALVE.

1. In functioning radio valves such as triodes and pentodes the electrodes in the valve are separated by:

   a. vacuum or gas.
   b. plastic or oil.
   c. germanium or silicon.
   d. copper or iron.

2. In a radio valve the space charge is developed around the:

   a. cathode.
   b. grid.
   c. anode.
   d. base.

3. In most radio valves the space charge is developed by:

   a. plate emission.
   b. solar emission.
   c. thermionic emission.
   d. inductive emission.

4. Electrons in radio valves are emitted by the:

   a. anode.
   b. screen grid.
   c. grid.
   d. cathode.

5. In valves electrons travel through:

   a. liquid electrolytes.
   b. gases or vacuum.
   c. crystal semiconductor materials.
   d. conductive metal rods.

6. The cathode of a valve is made of oxides of metals such as nickel or thorium so that when the cathode is hot it will freely emit:

   a. radio waves.
   b. protons.
   c. electrons.
   d. atoms.

7. Heating certain metals causes electrons to collect in a "cloud" around the metal. These electrons are referred to as:

   a. a space charge
   b. the grid bias.
   c. plate current.
   d. anode load.

8. A semiconductor and a valve both allow electron movement. The principal difference is that only in valves do the electrons:

   a. move towards the positive side of the circuit.
   b. move towards the negative side of the circuit.
   c. travel in a gas or near vacuum.
   d. travel in a solid material.

9. The part of the radio valve which heats the cathode to liberate the electrons is the:

   a. anode.
   b. cathode.
   c. heater.
   d. grid.

10. Valves rely on thermionic emission for their operation. This means emission of:

    a. electrons due to heat.
    b. electrons due to electric fields.
    c. protons due to heat.
    d. protons due to electric fields.

11. Valves usually dissipate or "waste" useful power. Most of this power is dissipated in the form of:

    a. heat.
    b. light.
    c. sound.
    d. radio waves.

12. The number of functional electrodes in a diode valve is:

    a. one.
    b. two.
    c. three.
    d. four.

13. A valve containing only a cathode and an anode is called a:

    a. diode.
    b. triode.
    c. pentode.
    d. electrode.

14. In a diode valve electrons will only flow from:

a. cathode to grid.
b. grid to cathode.
c. cathode to anode.
d. anode to cathode.

15. Diode valves are frequently used in:

a. tuned circuits.
b. aerial tuning units.
c. rectifier circuits.
d. capacitor dielectric.

16. Diodes will conduct when the anode is:

a. more positive than the cathode.
b. more negative than the cathode.
c. as positive as the cathode.
d. as negative as the cathode.

17. In a diode valve, as the anode is made progressively more positive than the cathode, the current flowing will:

a. increase to a maximum.
b. decrease to zero.
c. remain at zero.
d. remain constant.

18. When a diode valve is saturated the maximum:

a. anode to cathode current occurs.
b. cathode to anode current occurs.
c. cathode temperature is reached.
d. anode temperature is reached.

19. The reason that diode valves will conduct in one direction is that only the:

a. cathode will liberate electrons.
b. anode will liberate electrons.
c. screen will liberate electrons.
d. grid can liberate electrons.

20. When the greatest current flows in a cathode - anode section of a valve the valve is said to be:

a. cut off.
b. positively biased.
c. negatively biased.
d. saturated.

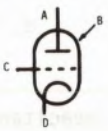
21. In a triode valve the anode load is connected between the anode and the:

a. grid resistor load.
b. cathode resistor load.
c. positive voltage line.
d. negative voltage line.

22. This is a symbol for a:

a. a diode valve.
b. a triode valve.
c. PNP transistor.
d. FET transistor.

23. On the symbol for a triode the cathode is labelled:



a. A.
b. B.
c. C.
d. D.

24. To keep a valve operating in a linear way a steady grid voltage is applied. This is referred to as the:

a. bias voltage.
b. load resistance.
c. saturation voltage.
d. vacuum resistance.

25. In triode and pentode valves small level A.C. signals applied to the grid can produce large A.C. signals in the valve load circuit. This ability is known as:

a. conduction. b. rectification. c. detection. d. amplification.

26. In a triode valve there are three electrodes. These are:

a. diode, triode and pentode. b. source, gate and drain.
c. cathode, grid and anode. d. silicon, germanium and copper.

27. In a radio valve the electrode which can cause large variations in current is the:

a. grid. b. anode. c. cathode. d. collector.

28. In a triode valve the main electron flow is from:

a. anode to cathode. b. grid to cathode.
c. cathode to anode. d. cathode to grid.

29. When a triode valve is used as an amplifier the signal is applied to the:

a. base, b. grid. c. anode. d. gate.

30. If the grid of a triode valve is more negative than the cathode it is said to be:

a. positively biased. b. negatively biased.
c. cut off. d. saturated.

31. Protective bias in a valve circuit would be applied if there was a circuit malfunction. It would protect the valve from large:

a. grid currents. b. anode currents.
c. base currents. d. collector currents.

32. In a triode valve the element that corresponds to the base of a bipolar transistor is the:

a. cathode. b. grid. c. anode. d. vacuum.

33. In a triode amplifier valve, the bias voltage is developed between the:

a. grid and anode. b. cathode and anode.
c. grid and cathode. d. anode and heater.

34. In a triode valve, amplification occurs when varying signals applied to the:

a. anode, vary cathode to grid electron current.
b. anode, vary grid to cathode electron current.
c. grid, vary cathode to anode electron current.
d. grid, vary anode to cathode electron current.

35. A pentode valve has:

a. 2 grids. b. 3 grids. c. 4 grids. d. 5 grids.

36. Compared to a triode the pentode has a smaller;

a. amplification factor. b. anode - grid capacitance.
c. grid bias voltage. d. number of grids.

37. High speed electrons arriving at the plate of a pentode can dislodge other electrons resulting in secondary emission. This effect is limited by the action of the:

a. cathode. b. signal grid. c. screen grid. d. suppressor grid.

38. The valve electrode which limits the capacitative effect between grid and anode is the:

a. cathode. b. signal grid. c. screen grid. d. suppressor grid.

39. A valve which in general has a very low capacitance between grid and anode is:

a. diode. b. anode. c. triode. d. pentode.

40. A valve has seven separately connected pins on its base. Two of these pairs are connected to the valve heaters. Thus the valve is likely to be:

a. a diode. b. a triode. c. a pentode. d. an anode.

41. In a pentode there are three grids. One is the control or signal grid. The other grids are:

a. diode and triode grids.
b. cathode and anode grids.
c. screen and suppressor grid.
d. PNP and NPN grids.

AMPLIFICATION.

1. A circuit designed to give a magnified copy of its input signal is called:

a. a receiver. b. a modulator. c. an oscillator. d. an amplifier.

2. An amplifier is supplied with a 100 Hz sine wave signal. The output is increased in amplitude but it is a faithful copy of the incoming signal. This amplifier would be classed as a:

a. linear oscillator.
b. reactance oscillator.
c. linear amplifier.
d. reactance amplifier.

3. If an amplifier becomes non-linear then the output signal would:

a. generate key clicks.
b. become distorted.
c. possess two sidebands.
d. be over modulated.

4. Which of the following is an amplifier coupling method?

a. resistance-capacitative coupling
b. impedance-resistance coupling
c. electro-dynamic coupling
d. ferrite-iron core coupling

5. Often amplifiers have several valves connected together. The electrical way the valves are linked together is referred to as:

a. biasing. b. amplifying. c. coupling. d. heat sinking.

6. A microphone is found to have insufficient output to correctly drive a modulator. A suitable way of increasing the signal level from the microphone would be to use:

a. an AF amplifier.
b. an RF amplifier.
c. an AF oscillator.
d. an RF oscillator.

7. Many RF amplifiers have tuned resonant circuits as their loads. These amplifiers will:

a. amplify all signal frequencies by the same amount.
b. amplify different frequencies different amounts.
c. be suitable for microphone amplifiers.
d. be suitable for audio power amplifiers.

8. In an RF amplifier coupled with tuned circuits energy circulates within the tuned circuit. This energy flows between:

a. resistors and diodes.
b. diodes and triodes.
c. transistors and FETs.
d. inductors and capacitors.

9. To increase the level of very weak radio signals from a radio aerial it would be best to use:

a. an AF amplifier.
b. a RF amplifier.
c. an AF oscillator.
d. a RF oscillator.

10. R F amplifiers which use parallel combinations of coil and capacitor for loads for each stage are:

a. pre-amplifier coupled.
b. resistor-capacitor coupled.
c. tuned circuit coupled.
d. common emitter coupled.

11. An R F oscillator should be electrically and mechanically stable. This is to ensure that the oscillator does not:

a. cause undue distortion.
b. drift in frequency.
c. generate key clicks.
d. become over modulated.

12. An amplifier with positive feedback at a particular frequency will act as:

a. a pre-amplifier.
b. a power amplifier.
c. an oscillator.
d. a reactance amplifier.

13. In an amplifier the action of transferring some output signal into an earlier stage of the amplifier is known as.

a. frequency multiplication.
b. signal feedback.
c. balanced modulation.
d. dielectric factor.

14. Oscillator circuits in transceivers are usually supplied with very stable voltage. The fixed voltage is necessary to ensure constant:

a. bias.
b. frequency.
c. SWR.
d. shielding.

15. An AC signal which has its frequency controlled by electrical components is generated by:

a. an oscillator.
b. a rectifier.
c. a detector.
d. an amplifier.

16. With a single amplifier the most linear class is:

a. A.
b. B.
c. C.
d. D.

17. A most efficient power amplifier operates in class:

a. A.
b. B.
c. C.
d. D.

18. Amplifiers vary in efficiency and degree of linearity. To describe them, ampliers are usually grouped into groups based on the notation:

a. NPN or PNP
b. diode,triode or pentode.
c. class A,B,AB or C.
d. series or parallel resonant.

19. The least efficient power amplifier.operates in class:

a. A.
b. B.
c. C.
d. D.

SEMICONDUCTOR DEVICES

THE DIODE.

1. Which of the following is not a solid state semiconductor device:

   a. silicon diode.
   b. pentode valve.
   c. bipolar transistor.
   d. field effect transistor.

2. Of the following which is regarded as a semiconductor?

   a. copper.
   b. sulphur.
   c. silicon.
   d. tantalum.

3. Substances such as germanium and silicon in a pure state are usually good:

   a. insulators.
   b. conductors.
   c. tuned circuits.
   d. inductors.

4. Two materials most frequently used to construct semiconductor diodes are:

   a. germanium and silicon.
   b. iron and carbon.
   c. lead and copper.
   d. plastic and glass.

5. Doped semiconductors are usually known as:

   a. A,B and C type semi conductors.
   b. P and N type semiconductors.
   c. AC and DC type semi conductors.
   d. AM and SSB type semiconductors.

6. A semiconductor is said to be doped when it has added to it small quantities of:

   a. electrons.
   b. resistors.
   c. anodes.
   d. impurities.

7. Semiconductor diodes have:

   a. 1 lead.
   b. 2 leads
   c. 3 leads.
   d. 4 leads.

8. The connections made to a semiconductor diode are known as:

   a. zener and varicap.
   b. anode and cathode.
   c. gate and screen.
   c. collector and base.

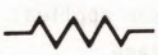
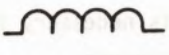
9. Which electronic component is represented by this symbol?

   a. transistor
   b. capacitor
   c. diode
   d. rheostat

10. In the radio component shown electrons travel:

    a. from A to B.
    b. from B to A.
    c. in either direction.
    d. from A to B every 50 seconds.

11. Which of the following symbols is correct for a diode?

    a.
    
    b.
    
    c.

    d.

12. A diode simply specified as "6.8 volts" would most likely be a:

    a. varicap diode.
    b. zener diode.
    c. resonance diode.
    d. vacuum diode.

13. A diode is formed from a:

a. single chip of P type material.
b. single chip of N type material.
c. junction of P and N type materials.
d. junction of two "P" type materials.

14. Semiconductor diodes when connected in a circuit need a small forward voltage to cause them to conduct. This forward voltage is:

a. the same for all types of diodes.
b. less for silicon than for germanium diodes.
c. less for germanium than for silicon diodes.
d. referred to as rectified current.

15. Diodes are an important circuit component. This is because they normally:

a. amplify small currents.
b. amplify small voltages.
c. conduct in one direction.
d. act as resonant circuits.

16. A silicon diode rectifier has:

a. cathode, anode and gate.
b. screen and cathode.
c. drain and gate.
d. anode and cathode.

17. A silicon diode rectifier allows electrons to flow only when:

a. the cathode is positive with respect to the anode.
b. the anode is positive with respect to the cathode.
c. both cathode and anode are equally positive.
d. both anode and cathode are equally negative.

18. A diode is marked "100 volt maximum inverse". This means the diode will conduct electrons from anode to cathode when the anode (relative to cathode) is:

a. 90 volts positive.
b. 110 volts negative.
c. 90 volts negative.
d. 110 volts positive.

19. A diode is rated at "10 mA, 100 PIV". This diode would fail if it were used as a rectifier in a 12 volt 5 ampere power supply because the:

a. peak forward voltage of diode would be exceeded.
b. peak inverse voltage of diode would be exceeded.
c. forward current rating of diode would be exceeded.
d. reverse current rating of diode would be exceeded.

20. A receiver needs a voltage of exactly 6.8 volts at a point in the circuit. A suitable diode to develop this exact voltage would be a:

a. varicap diode.
b. bridge diode.
c. zener diode.
d. detector diode.

21. The diode normally used to regulate voltage is called a:

a. varicap diode.
b. bridge rectifier.
c. zener diode.
d. germanium diode.

22. To change the capacitance of a varicap diode it is necessary to change the applied:

a. resistance.
b. frequency.
c. resonance.
d. voltage.

23. A diode that is designed to have a varying junction capacitance is called a:

a. varicap diode.
b. bridge capacitor diode.
c. vari-inductor diode.
d. zener voltage diode.

24. A diode has the reverse bias voltage changed slightly. What other property will also change:

a. peak inverse voltage. b. junction temperature.
c. peak inverse current. d. junction capacitance.

25. Comparing a valve diode to a semiconductor diode it is true to say about the semiconductor diode that it is:

a. larger in size. b. physically more robust.
c. less efficient. d. likely to dissipate more heat.

BIPOLAR AND FIELD EFFECT TRANSISTORS.

1. Bipolar transistors usually have:

a. 4 leads. b. 3 leads. c. 2 leads. d. 1 lead.

2. A semiconductor is described as "general purpose audio NPN device". This would be a:

a. triode valve. b. silicon diode. c. bipolar transistor. d. field effect transistor.

3. The basic semiconductor amplifying device is:

a. diode. b. transistor. c. P-N junction. d. valve.

4. This circuit symbol represents:

a. an NPN transistor.
b. a PNP transistor.
c. an N CHANNEL FET.
d. a P channel FET.

5. The part represented by the "X" on the circuit symbol is the:

a. emitter.
b. gate.
c. base.
d. collector

6. The lead marked "X" from the transistor represents:

a. anode.
b. emitter.
c. base.
d. collector.

7. The three leads from a PNP transistor are:

a. collector, source, drain. b. gate, source, drain.
c. drain, base, source. d. collector, emitter, base.

8. The two basic types of bipolar transistors are:

a. P and N channel types. b. NPN and PNP types.
c. diodes and triode types. d. varicaps and zener types.

9. The direction of the arrow head in the transistor symbol indicates if the transistor is:

a. an AF or RF type. b. an AM or SSB type.
c. an A or B class type. d. a PNP or NPN type.

10. The part of a transistor shown with an arrow head in a transistor symbol represents the:

a. emitter. b. base. c. collector. d. gate.

11. For a bipolar transistor to act as a common emitter amplifier the input signals are applied to the:

a. base. b. collector. c. drain. d. emitter.

12. D C current gain in transistors is often referred to as:

a. bias value. b. back EMF. c. beta value. d. DSB value.

13. A small direct current applied to the base of a transistor can produce a large current flow in the transistor collector circuit. This transistor characteristic is:

a. voltage gain. b. resistive gain. c. capacitive gain. d. current gain.

14. The beta value for transistors refers to:

a. transistor direct current gain.
b. high PIV in load circuit.
c. wiring code for NPN transistors.
d. emitter-collector resistance.

15. In a bipolar transistor with a high beta value, a small current variation in the base circuit will produce:

a. small emitter-collector current change.
b. very large emitter-collector current change.
c. small source-drain current change.
d. very large source-drain current change.

16. When a low level signal is applied to a transistor input a larger level of signal is produced in the transistor load. This indicates the transistor is acting as an effective:

a. modulator. b. capacitor. c. amplifier. d. detector.

17. When operating transistors as linear amplifiers, bias current is supplied. This usually ensures that AC input signals will be:

a. converted to pulsed DC output currents.
b. amplified without excessive distortion.
c. able to flow into the final output circuit.
d. not be reflected back along the input circuit.

18. When a transistor is acting as a linear amplifier there are usually two currents flowing in the base circuit. One is the incoming signal and the other is a steady current known as the:

a. bias current. b. acceptor current. c. load current. d. diode current.

19. When a transistor is acting as a common emitter amplifier the largest current flows in the:

a. emitter collector circuit.
b. emitter base circuit.
c. base collector circuit.
d. base grid circuit.

20. To adjust the steady current in the collector circuit of a transistor amplifier it is necessary to:

a. vary the frequency of AC entering the base.
b. change and adjust the doping of the semiconductor.
c. reverse the emitter and collector connections.
d. adjust the steady current to the base.

21. A transistor can be destroyed by excessive:

a. light. b. heat. c. sound. d. insulation.

22. A feature common to both valves and transistors is that they both:

a. convert electrical energy to radio waves.
b. use heat to cause electron movement.
c. have electrons drifting through a vacuum.
d. can amplify signals.

23. The collector in a PNP transistor is equivalent to what element in a triode valve?

a. heater b. cathode c. grid d. anode

24. In a triode valve the element equivalent to the base of a transistor is the:

a. plate. b. cathode. c. grid. d. heater.

25. A correctly biased PNP transistor will conduct when:

a. emitter is more positive than the collector.
b. collector is more positive than the emitter.
c. emitter and collector are both wired directly to negative voltage line.
d. emitter and collector are both wired directly to positive voltage line.

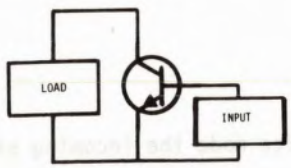
26. In a circuit a funtioning semiconductor has its emitter more positive than its collector. This device is probably:

a. a PNP bipolar. b. an NPN bipolar. c. a P channel FET. d. an N channel FET

27. When a transistor is operating in a common emitter circuit the emitter is common to both:

a. diode and FET circuits. b. input and output circuits.
c. emitter and gate circuits. d. battery terminal circuits.

28. This amplifier is operating as:



a. a common emitter circuit.
b. a common collector circuit.
c. a common base circuit.
d. a balanced modulator circuit.

29. To help keep a power transistor within its temperature range use is made of a:

a. thermostat. b. evaporative cooler.
c. heat sink. d. current cut out.

30. Power transistors are often mounted on finned aluminium blocks since these allow the:

a. transistor to be more easily mounted. b. electricity to flow through leads.
c. heat to be effectively transferred to the air. d. base to receive the correct bias.

31. Transistors are usually designed to operate within a certain temperature range. If the transistor is operated at higher temperatures then:

a. the case will melt. b. its electrical characteristics will change.
c. the emitter and collector leads reverse. d. the grid will vaporize.

32. Transistors are often mounted on heat sinks. This is so that when the transistor is operating, the heat:

a. is converted to electricity.
b. does not produce excessive temperatures.
c. is transferred to the electric circuitry.
d. does not convert to radio waves.

33. When soldering a small transistor to safeguard the transistor it is wise to use:

a. zener diode connected to emitter and base.
b. a temperature compensated soldering iron.
c. a heat sink on the transistor leads.
d. a ferrite core to reduce any ambient AC.

34. When a bipolar transistor is operating as an amplifier the transistor is biased to ensure correct operation: This bias is applied to the:

a. grid. b. base. c. collector. d. gate.

35. Compared to valves transistors are very efficient amplifiers of small signals since there is little generation of waste:

a. sound. b. radio waves. c. modulation. d. heat.

36. Transistors acting as amplifiers should have their bias stabilized to compensate for changes in:

a. input signal frequency.
b. transistor capacitance.
c. input signal level.
d. transistor temperature.

37. As effective amplifiers of small signals, transistors compared to valves generally:

a. use higher voltages and currents.
b. convert more electrical power to heat.
c. are much smaller size.
d. are more liable to mechanical damage.

38. A disadvantage of transistors as amplifiers compared to valves is that transistors are more liable to:

a. physical damage by sudden movement.
b. need very high voltages to operate well.
c. permanent damage by sudden overloads.
d. develop waste heat due to filament operation.

39. For a FET to act as an amplifier in the common source mode the incoming signal is applied to the:

a. gate. b. base. c. source. d. drain.

40. When a FET is acting as an amplifier, the output current variations appear in the:

a. emitter-collector circuit.
b. source-drain circuit.
c. emitter-base circuit.
d. gate-source current.

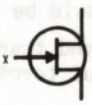
41. The high input sensitivity of the FET makes the transistor ideal for:

a. stabilizing power supply voltages.
b. acting as a diode in a power supply.
c. use as an amplifier in the R.F. stages of a receiver.
d. stabilizing power supply currents.

42. This circuit symbol refers to a:

a. bipolar transistor.
b. diode.
c. FET.
d. triode valve.

43. The part of the circuit symbol marked "X" represents:



a. gate.
b. base.
c. source.
d. anode.

44. FETs are frequently used as amplifiers for very weak signals since FETs are sensitive to small:

a. radio waves.
b. voltage variations.
c. capacitance changes.
d. inductance changes.

45. The two basic types of FETs are:

a. N and P channel types.
b. NPN and PNP types.
c. germanium and silicon types.
d. inductive and capacitive types.

46. A semiconductor amplifying device that is very sensitive to small voltage variations is the:

a. valve. b. field-effect transistor. c. diode. d. bipolar transistor.

47. A semiconductor has its leads labelled gate, drain and source. It is best described as a:

a. bipolar transistor.
b. germanium diode.
c. gated transistor.
d. field-effect transistor.

48. The semiconductor device which compares closely to the valve in terms of voltage sensitivity and high input impedance is the:

a. bipolar transistor.
b. field-effect transistor.
c. diode.
d. light emitting diode.

49. If a semiconductor was described as being "N channel" it is probably a:

a. diode.
b. silicon diode.
c. transistor-bipolar.
d. transistor-field effect.

50. A fundamental difference between a field effect transistor and a bipolar transistor is the field effect device is able to generate output:

a. current variations using input voltage variations.
b. current variations using input current variations.
c. voltage variations using input voltage variations.
d. voltage variations using input current variations.

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

A.C. OPERATED POWER SUPPLIES.

1. Before checking a fault in a mains operated power supply unit it would be safest to first:

   a. short out leads of filter capacitor.
   b. turn off power point and remove power plug.
   c. check action of capacitor bleeder resistance.
   d. remove and check fuse from power supply.

2. In a mains operated DC power supply the main on-off switch would be best wired between:

   a. rectifier and filter capacitors.
   b. mains wiring and transformer.
   c. transformer and rectifier.
   d. fuse and output terminals.

3. Wires carrying high voltage supplies to valves in a Novice transmitter should be well insulated to avoid:

   a. short circuits. b. overheating. c. over modulation. d. SWR effects.

4. A suitable way of connecting the high voltage leads from a mains operated power supply to a transmitter would be using:

   a. well labelled bare brass screws.
   b. mains type plugs and sockets.
   c. heavy bare copper straps.
   d. shrouded plugs and sockets.

5. Fault finding on a power supply for a Novice transmitter while the supply is operating is not a recommended technique because of the risk of:

   a. electric shock.
   b. damaging the diodes.
   c. overmodulation.
   d. blowing the fuse.

6. When connecting a three wire power flex lead with blue, brown and yellow-green coded wires into the primary of a power supply, the yellow-green wire should be connected to:

   a. primary winding of the transformer.
   b. secondary winding of the transformer.
   c. chassis and metalwork of the power supply.
   d. positive output connection of the supply.

7. The normal domestic AC voltage obtained from power points in Australia is:

   a. 117 volts. b. 200 volts. c. 240 volts. d. 2.4 kilovolts.

8. The mains frequency in Australia is:

   a. 50 Hz. b. 100 Hz. c. 110 Hz. d. 240 Hz.

9. To make a power supply as safe as possible the earth wire from the power lead should be left:

   a. disconnected.
   b. connected to the operator of the power supply.
   c. connected to the negative output lead.
   d. connected to the metal case of the power supply.

10. On mains operated power supplies the earth wire should be connected to the metal chassis of the power supply. This ensures in case there is a fault in the power supply that the chassis does:

a. not develop a high voltage compared to the ground.
b. not become conductive to prevent electric shock.
c. become conductive to prevent electric shock.
d. develop a high voltage compared to the ground.

11. A suitable rating of a power supply to operate the final power amplifier transistor of a Novice transmitter should be:

a. 1 watt. b. 30 watts. c. 150 watts. d. 1 kilowatt.

12. A DC supply for the final stage of a Novice transmitter operates at a P D of 12 volts. A suitable current rating for the supply would be:

a. 3 microamps. b. 3 milliamps. c. 3 amps. d. 3 kilowatts.

13. A mains-operated power transformer is operating a Novice all-transistorised transmitter. The likely power consumption from the mains supply would be:

a. 1 watt. b. 30 watts. c. 300 watts. d. 3 kilowatts.

14. A power supply is to supply DC at 12 volts 5 amps. The power transformer should be rated at least:

a. 3 watts. b. 17 watts. c. 60 watts. d. 6 kilowatts.

15. A power supply designed for use with a valve type Novice transmitter may be regarded as being a:

a. low voltage high current unit.
b. low voltage low current unit.
c. high voltage high current unit.
d. high voltage low current unit.

16. In a mains AC to DC power supply the action of changing the voltage to a suitable level is achieved by the:

a. transformer. b. rectifier. c. filter. d. fuse.

17. In an AC to DC power supply to operate a radio the three essential sections are:

a. transformer - rectifier - filter.
b. transformer - resonant circuit - diode.
c. rectifier - voltage divider - filter.
d. voltage divider - diode rectifier - resonant circuit.

18. In a mains operated DC power supply the rectifier should be connected between:

a. AC power supply and transformer.
b. filter and pilot light.
c. transformer and filter.
d. filter and output terminals.

19. In an AC to DC power supply the component value that most determines the final voltage of the supply is the:

a. capacitance of the filter capacitance.
b. turns ratio of the transformer.
c. inductance of the choke.
d. peak inverse ratings of the diodes.

20. An important part of a simple power supply is the diode used in the rectifier. It can convert AC to DC since it:

a. allows electrons to flow from anode to cathode.
b. allows electrons to flow from cathode to anode.
c. has a high resistance to AC but not to DC.
d. has a high resistance to DC but not to AC.

21. The basic component in a rectifier unit is a:

a. capacitor. b. diode. c. choke. d. transformer.

22. In a mains operated DC power supply the transformer should be connected between:

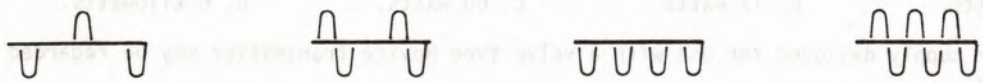
a. AC power supply and rectifier.
b. rectifier and output.
c. rectifier and filter.
d. filter and DC terminals.

23. To convert AC to pulsating DC you could use a:

a. resistor. b. diode. c. capacitor. d. transformer.

24. If AC as shown is rectified by a single diode. The most likely current to flow is as shown in:

a. b. c. d.



25. The DC produced by a diode rectifier is not suitable for direct use by a receiver since the DC:

a. still reverses its current direction each half cycle.
b. is travelling in one direction but it is pulsating.
c. has a high inductive component.
d. has a high capacitive component.

26. Pulsating DC direct from a rectifier could be described as:

a. being DC but reversing in direction.
b. being about half each of AC and DC.
c. having an AC component on DC.
d. DC similar to the DC from a battery.

27. The minimum number of diodes to produce DC suitable for filtering from an AC supply is:

a. 1. b. 2. c. 4. d. 6.

28. The DC that results from a simple single diode rectifier could be best described as:

a. peak inverse DC.
b. capacitor filtered DC.
c. full wave DC.
d. pulsating DC.

29. Which of the following diagrams indicates the likely DC output from a full wave rectifier?

a. b. c. d.

30. Full wave rectifiers are preferred in many power supplies since they produce, compared to half wave rectifiers:

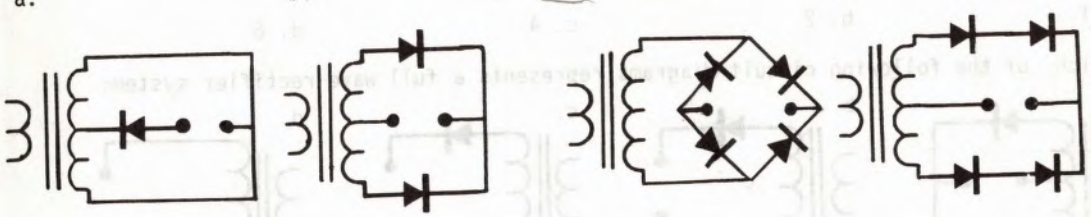
a. higher DC voltages and higher AC ripple levels.
b. higher DC voltages and lower AC ripple levels.
c. lower DC voltages and higher AC ripple levels.
d. lower DC voltages and lower AC ripple levels.

31. Full wave rectifiers are more efficient than half wave ones since:

a. they use less diodes.
b. they produce DC for each half wave of AC supplied.
c. they produce DC for every alternate half wave of AC supplied.
d. full wave rectifiers are cheaper to produce.

32. Which of the following circuits is a bridge type rectifier:

a. b. c. d.



33. What would be the minimum number of silicon diodes that could be connected to form a full wave rectifier of the bridge type?

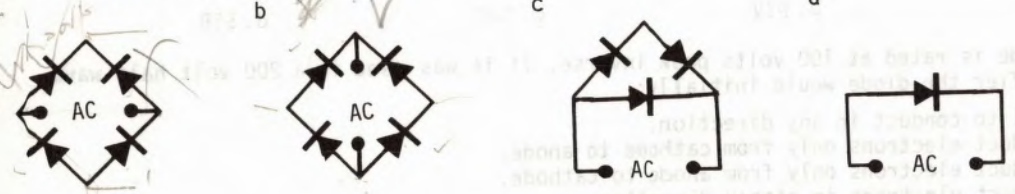
a. 1. b. 2. c. 4. d. 6.

34. The ripple frequency of a full wave rectifier power supply when operating from a 50 Hz mains supply is:

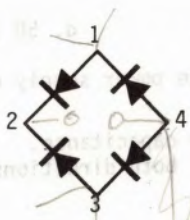
a. 25. b. 50. c. 100. d. 240.

35. Which of the following diagrams represents the correct arrangement of diodes to form a bridge rectifier?

a b c d



36. In the rectifying circuit shown the terminals which would be connected to the AC supply would be:



a. 1 and 2.
b. 2 and 3.
c. 3 and 4.
d. 1 and 3.

37. A full wave rectifier using two diodes and a centre tapped transformer has:

a. pulsating DC flowing in the centre tap lead.
b. both diodes conducting simultaneously.
c. both diodes conducting continuously.
d. half wave DC produced.

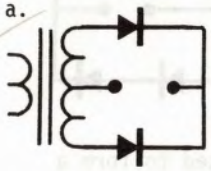
38. In which of the following power supply circuits would the secondary winding be fitted with a centre tap?

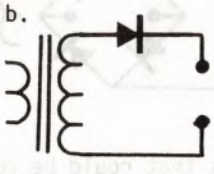
a. half wave rectifier using one silicon diode.
b. half wave rectifier using a diode valve with a single anode.
c. bridge rectifier using four rectifiers.
d. full wave rectifier using two diodes.

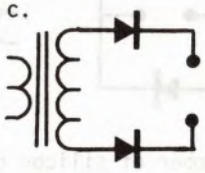
39. What would be the miniumum number of silicon diodes connected to form a full wave rectifier using a transformer with a centre tapped secondary?

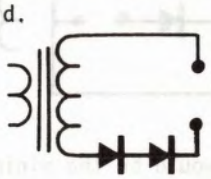
a. 1 b. 2 c. 4 d. 6

40. Which of the following circuit diagrams represents a full wave rectifier system:

a. 

b. 

c. 

d. 

41. When wiring a low voltage DC supply to operate a solid state Novice transceiver thick wire should be used. This ensures that:

a. there is minimum voltage drop along wiring.
b. there is maximum voltage drop along wiring.
c. there is minimum current drop along wiring.
d. there is maximum current drop along wiring.

42. The ability of a diode not to conduct electrons from anode to cathode even when the anode is made very negative compared to the cathode is known as the diode's:

a. CW b. PIV c. SWR d. SSB

43. A diode is rated at 100 volts peak inverse. If it was used in a 200 volt half wave rectifier the diode would initially:

a. fail to conduct in any direction.
b. conduct electrons only from cathode to anode.
c. conduct electrons only from anode to cathode.
d. conduct electrons in either direction.

44. A 12 volt supply is rated at 60 watts maximum. The single diode in the half wave rectifier should be rated at least at:

a. 5 milliamperes. b. 5 microamperes. c. 5 amperes. d. 50 amperes.

45. A diode with a low PIV rating when used in a high voltage power supply will fail because the diode will:

a. have a low power rating.
b. have a low capacitance.
c. act as an inductance.
d. conduct in both directions.

46. A diode with a large surface area and heavy metal leads is most likely to have a:

a. low power rating. b. low PIV. c. high power rating. d. high PIV.

47. In power supplies the diodes must have an adequate PIV rating. PIV stands for:

a. peak inverse voltage.
b. peak index volume.
c. peak instrument voltage.
d. peak inductance value.

48. The part of a mains operated power supply which should smooth the DC supplied from the rectifier is the:

a. power lead. b. transformer. c. fuse. d. filter.

49. In a mains operated DC power supply the filter section should be connected between:

a. power plug and transformer.
b. rectifier and output.
c. transformer and rectifier.
d. power plug and pilot light.

50. Two components most frequently used in filters are:

a. triodes and pentodes.
b. zener and varicap diodes.
c. transistors and FETs.
d. capacitors and inductors.

51. A 100 microfarad capacitor is a more effective filter capacitor in a DC power supply than a 10 microfarad one since the large value capacitor has:

a. highest stray inductance for AC ripple.
b. lowest stray inductance for AC ripple.
c. highest reactance for AC ripple.
d. lowest reactance for AC ripple.

52. Filter capacitors in a power supply for a valve final stage in an SSB Novice transmitter could be rated at:

a. 100 microfarad 600 volts working.
b. 100 microfarad 20 volts working.
c. 1 microfarad 600 volts working.
d. 1 microfarad 20 volts working.

53. Filter capacitors in a power supply to operate a solid state transceiver should be rated at:

a. 10 microfarads 600 volts working.
b. 10 microfarads 20 volts working.
c. 2000 microfarads 600 volts working.
d. 2000 microfarads 20 volts working.

54. Both capacitors and inductors are used in filters because they have different impedances for:

a. high and low voltages.
b. AC and DC.
c. RF and AF.
d. farads and henrys.

55. Filter capacitors used in a power supply for a Novice AM valve transmitter would best be rated at:

a. 5 picofarads 600 volts working.
b. 5 microfarads 600 volts working.
c. 5 picofarads 18 volts working.
d. 5 microfarad 18 volts working.

56. The main function of the filter circuit in a power supply is to treat the incoming DC to:

a. rectify it to AC.
b. increase its voltage.
c. eliminate any AC. component.
d. increase the available power.

57. In a 250 volt DC power supply to operate a Novice transmitter a suitable value for the inductance of the choke would be:

a. 250 volts. b. 25 volts. c. 2 microhenries. d. 20 henrys.

58. A suitable capacitor type for an effective filter in a 12 volt supply for a communications receiver would be:

a. air dielectric type.
b. split stator type.
c. mica dielectric type.
d. electrolytic type.

59. Electrolytic capacitors used in power supply filters must:

a. be mounted vertically to prevent loss of electrolyte.
b. be used only in AC circuits.
c. connect with the correct polarity of DC.
d. be connected between transformer and rectifier.

60. A radio component that looks like a transformer but has only two leads from the windings is called:

a. a choke.
b. step down transformer.
c. mono-transformer.
d. a reactance transformer.

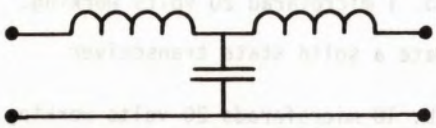
61. The function of large electrolytic capacitors in DC power supply filters is to:

a. prevent radio frequencies from entering the mains.
b. improve the frequency response of audio amplifiers.
c. by-pass the DC to earth.
d. to smooth out the ripple frequency superimposed on the DC.

62. The filter sketched would be referred to as:

a. choke input b.
b. diode input c.
c. half wave.
d. capacitor input.

63. The filter sketched is known as:



a. choke input type.
b. capacitor input type.
c. resistive-capacitive type.
d. DC multiplier circuit.

64. Chokes are used in filters since they have a high:

a. reactance to AC.
b. reactance to DC.
c. bleeder resistance to AC.
d. bleeder resistance to DC.

65. Capacitors used in power supply filters would have a high:

a. impedance to AC.
b. impedance to DC.
c. zener voltage for AC.
d. zener voltage for DC.

66. In general a SSB transmitter will need larger filter capacitors in its power supply than a similar AM transmitter. This is because the SSB transmitter:

a. operates on a higher voltage.
b. operates on a higher current.
c. has large variations in current demand.
d. has large variations in voltage demand.

67. Devices such as zener diodes and gas regulator tubes are designed to regulate:

a. resistance.
b. voltage.
c. current.
d. capacitance.

68. DC power supplies usually have some form of voltage regulation. This regulation ensures that the voltage:

a. increases as load current increases.
b. decreases as load current increases.
c. does not change as load current changes.
d. changes regularly even though load current does not change.

69. The main purpose of bleeder resistors in a DC power supply is to:

a. stabilise output voltage to a steady level.
b. ensure good ripple filtering of the output.
c. provide current overload protection.
d. discharge filter capacitors when supply is turned off.

70. The most suitable regulating device for a 250 volt DC power supply would be:

a. voltage regulator valve.
b. filter choke.
c. silicon diode.
d. zener diode.

71. Frequently with DC power supplies it is necessary to have voltage fixed at a certain value. Two components suitable for regulating voltage are.

a. bleeder resistors and current fuses.
b. field effect transistors and varicap diodes.
c. zener diodes and gas regulator tubes.
d. rectifiers and filter capacitors.

72. Which of the following would be suitable for regulating the DC being supplied to a transistor receiver?

a. regulator valve b. filter choke c. silicon diode d. zener diode

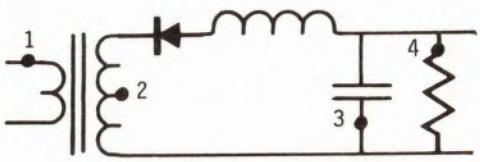
73. When obtaining a replacement fuse for a power unit care must be taken that it has the required:

a. voltage rating. b. power rating. c. current rating. d. capacitive rating.

74. The component included in electrical equipment to isolate the supply when current overload occurs is the:

a. fuse. b. panel lamp. c. transformer. d. electrolytic capacitor.

75. In the following circuit an HT power supply where would be the best place to fit a safety fuse:



a. 1.
b. 2.
c. 3.
d. 4.

76. To ensure that the filter capacitors in a DC supply do not retain large amounts of charge after the supply has been turned off the supply should have a:

a. zener voltage clamp.
b. safety fuse.
c. bleeder resistor.
d. a series resistor in power line.

77. A safety device to ensure that excess current cannot flow is called a:

a. pilot lamp. b. fuse. c. power diode. d. zener diode.

78. An operator notices the filter capacitors in a high voltage DC power supply are still charged to a high voltage several hours after the unit was switched off. He would suspect a fault in:

a. fuse. b. zener. c. rectifier circuit. d. bleeder resistors.

79. A fuse is a device which will go to an open circuit condition in the presence of high:

a. capacitance. b. resistance. c. current. d. modulation.

80. Gas regulator tubes are used to stabilize:

a. high voltages. b. high currents. c. low voltages. d. low currents.

HF TRANSMITTER.

1. Which stage of a correctly operating Amateur transmitter determines the frequency stability of the transmission?

a. oscillator b. buffer c. modulator d. power amplifier

2. In order to maintain continuous oscillation in a circuit, there must be:

a. positive feedback. b. negative feedback.
c. a stabilised supply. d. distortion.

3. Which property of a quartz crystal allows it to control the frequency of an oscillator?

a. the piezoelectric effect b. reflections from polished surfaces
c. the voltage-regulating effect d. the temperature-regulating capability

4. The most likely outcome of the fracture of a quartz crystal in an oscillator of a transmitter is:

a. R F oscillations will be produced on two different frequencies.
b. the following stage will break into oscillation.
c. the oscillator stage will cease to function.
d. the frequency of oscillation will increase.

5. Which of the following events is most likely to cause an oscillator to cease operation?

a. failure of the following stage b. loss of feedback in the oscillator
c. increased feedback in the oscillator d. loss of power supply stability

6. To slightly change the frequency of a transmitter an adjustment should be made to the:

a. buffer amplifier. b. frequency doubler.
c. power amplifier. d. oscillator.

7. It is unlikely that a frequency multiplier will oscillate of its own accord because:

a. it cannot amplify signals.
b. its output and input frequencies are different.
c. its voltage supply is too low.
d. it only operates at audio frequencies.

8. Frequency multiplier stages are found in:

a. SSB linear amplifiers. b. high level AM transmitters.
c. general purpose multimeters. d. speech amplifiers of voice transmitters.

9. In a frequency doubler, the output frequency is tuned to:

a. twice the input. b. four times the input.
c. same as the input. d. less than the input.

10. The function of a doubler stage in a transmitter is:

a. to double the frequency from the previous stage.
b. to double the power output of the previous stage.
c. to act as an impedance doubling device.
d. to allow the power amplifier to be used on two frequencies.

11. What general name is given to a transmitter stage in which the input is 3550 kHz and the output is 7.1 MHz?

a. frequency converter b. quadrupler
c. buffer d. doubler

12. In a morse transmitter, the output of the crystal oscillator stage is 7050 kHz. If the next stage is a tripler, what frequency appears at its output?

a. 7050 kHz b. 14.1 MHz c. 21.15 MHz d. 28.200 kHz

13. If a transmitter continues to produce an output even when the crystal is removed from the crystal oscillator, then which stage is most likely to be functioning incorrectly?

a. the power amplifier
b. the power supply
c. the audio preamplifier
d. the modulator

14. If a transmitter PA stage produces RF output even if drive from the previous stage has failed, which transmitter stage would be operating incorrectly?

a. the power supply
b. the crystal oscillator
c. the power amplifier
d. the speech amplifier

15. If the power amplifier of a transmitter produces self-oscillations, which of the following procedures should be taken to remedy it?

a. fit a filter
b. neutralisation
c. excitation
d. amplification

16. Which of the following indicates the purpose of neutralisation?

a. cancels inter-electrode capacitance preventing positive feedback.
b. improves speech quality when modulation occurs
c. increases power output of the power amplifier
d. prevents the production of harmonic frequencies

17. Neutralisation in a valve power amplifier is used to reduce the effect of:

a. anode-grid capacitance.
b. anode-cathode capacitance.
c. cathode-grid capacitance.
d. anode-screen capacitance.

18. Neutralisation is generally not needed in a frequency multiplier stage because:

a. the input circuit is not very sensitive.
b. the input and output are on different frequencies.
c. the output stage is not coupled to the antenna.
d. the stage is only generating a little power.

19. When neutralising a power amplifier, the component whose value is adjusted is probably a:

a. capacitor. b. transistor. c. resistor. d. potentiometer.

20. Neutralisation of an RF power amplifier is usually achieved using some form of:

a. extra driving power.
b. negative feedback.
c. harmonic suppression.
d. transformer coupling.

21. A parasitic oscillation:

a. is an unwanted signal developed in a transmitter.
b. is generated by parasitic elements of a Yagi beam.
c. does not cause any radio interference.
d. is produced in a transmitter oscillator stage.

22. Parasitic oscillations in an RF power amplifier may be caused by:

a. lack of neutralisation.
b. excessive harmonic production.
c. unintended tuned circuits.
d. overdriven stages.

23. Parasitic oscillations in the RF power amplifier stage of a transmitter may be found:

a. at low frequencies only.
b. on harmonic frequencies.
c. at high frequencies only.
d. at high or low frequencies.

24. When replacing any input or output circuit elements in an RF power amplifier, the operator should check for the presence of:

a. parasitic oscillation.
b. oscillator drift.
c. voltage regulation.
d. antenna mismatch.

25. Parasitic oscillations are usually generated due to:

a. a mismatch between PA and feeder.
b. accidental resonant frequencies in the PA circuitry.
c. excessive drive or excitation to the PA stage.
d. harmonics from some earlier multiplier stage.

26. A small choke is sometimes wired into the input circuit of a transmitter power amplifier. The reason for this is to:

a. increase the scale of the grid current meter.
b. reduce the drive or excitation applied to the PA.
c. prevent parasitic oscillations.
d. match the PA to the feedline.

27. A short length of insulated copper wire wound over a resistor is placed in the anode lead of a power amplifier valve of a transmitter. It is:

a. a form of neutralisation.
b. a method of preventing overmodulation.
c. a method of protecting the PA in case bias is lost.
d. a way of preventing parasitic oscillations.

28. Parasitic oscillations in a transmitter may be recognised in a separate receiver as:

a. signals from the transmitter not controlled by the oscillator.
b. frequencies which are exact multiples of the transmitter frequency.
c. a signal remaining on the frequency when the transmit oscillator is off.
d. lack of modulation of the transmitted signal.

29. A harmonic of a signal transmitted at 3525 khz would be expected to occur at:

a. 3573 kHz.
b. 7050 kHz.
c. 14025 kHz.
d. 21050 kHz.

30. When checking a transmitter for presence of harmonics of the transmitter frequency, the device most useful in detecting such harmonics would be a:

a. dip oscillator.
b. wavemeter.
c. multimeter.
d. frequency counter.

31. One possible cause of TV interference by harmonics from an SSB transmitter is from "flat topping" - driving the final into non-linear operation. The most appropriate remedy for this is to:

a. reduce microphone gain.
b. reduce oscillator output.
c. use another antenna.
d. retune transmitter output.

32. In a transmitter, excessive harmonics are produced by:

a. a linear amplifier.
b. resonant circuits.
c. low SWR.
d. overdriven stages.

33. Harmonics may be produced in the RF power amplifier of a transmitter if:

a. the output tank circuit is not correctly tuned.
b. excessive modulation is applied to it.
c. the oscillator frequency is unstable.
d. modulation is applied to more than one stage.

34. What components in a transmitter should be suspected as likely causes of harmonic radiation?

a. the oscillator crystal
b. coils and capacitors in coupling stages
c. modulation transformer
d. filtering components in power supply

35. Harmonics produced in an early stage of a transmitter may be reduced in a later stage by:

a. greater input to the final.
b. transistors instead of valves.
c. tuned circuit coupling between stages.
d. larger value coupling capacitors.

36. It would be unwise to use the power amplifier of a transmitter as a multiplier stage because:

a. there is more likelihood of harmonic energy being radiated.
b. it is difficult to neutralise the PA stage.
c. the amplifier would run at lower efficiency.
d. it would be difficult to match the PA to the antenna.

37. The driver stage of a transmitter is located;

a. before the power amplifier.
b. between oscillator and buffer.
c. with the frequency multiplier.
d. after the output tank circuit.

38. The purpose of the final amplifier in a transmitter is to:

a. increase the frequency of a signal.
b. isolate the multiplier and later stages.
c. produce a stable radio frequency.
d. increase the power fed to an antenna.

39. The output tuning controls on a transmitter power amplifier:

a. allow efficient transfer of power to the antenna.
b. reduce the RF power output.
c. are involved in multiplying frequency.
d. are installed to prevent self-oscillation.

40. When the input and output tuning controls of a transmitter power amplifier are correctly adjusted, the amplifier:

a. operates with greater efficiency.
b. operates within legal power limits.
c. will always be linear.
d. produces most heat energy.

41. The tuning of a transmitter RF power amplifier should be done in as brief a time as possible because:

a. at this time power above the legal limit is produced.
b. high currents or voltages may damage that stage.
c. parasitic oscillations are produced.
d. damage may be done to the feedline.

42. The three controls on a multi-band transceiver which are involved with tuning of the RF power amplifier are generally labelled;

a. tune, clarifier, RF gain.
b. calibrate, loading microphone gain.
c. plate tune, loading, grid tune.
d. clarifier, grid tune, RF gain.

43. As the power amplifier tank circuit in a valve type transmitter is tuned to resonance, what indication is given by the plate current meter?

a. the needle rises to a peak reading at resonance
b. the needle rises steadily with no change at resonance
c. the needle remains steady unless DC plate voltage changes
d. the needle dips to a minimum value at resonance

44. An antenna changeover switch in a transmitter-receiver combination is necessary:

a. to prevent RF currents entering the receiver circuits.
b. to change antennas for operation on other frequencies.
c. so that one antenna can be used for transmitter and receiver.
d. to allow more than one transmitter to be used.

45. When using an antenna changeover switch in a transmitter-receiver combination, it would also be necessary to provide a switch to turn the:

a. VSWR meter off.
b. aerial rotator off.
c. filter bleeder resistors off.
d. transmitter off.

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

RECEIVING SYSTEMS

1. A receiver's sensitivity is its:

   a. ability to pick up and make weak signals audible.
   b. ability to separate signals close in frequency.
   c. method of detection of received signals.
   d. measured power of the audio amplifier.

2. Of two receivers the one capable of receiving the weakest signal would have:

   a. an RF gain control.
   b. the least internally generated noise.
   c. the loudest audio output.
   d. the greatest tuning range.

3. The figure in a receiver's specifications which indicates its sensitivity is:

   a. the band width of the IF in kilohertz.
   b. the audio output in watts.
   c. the signal plus noise to noise ratio.
   d. the tuning rate of the dial in kilohertz per division.

4. If two receivers of different sensitivity are tuned to receive the same signal, then compared with the more sensitive receiver, the less sensitive receiver will produce:

   a. more than one signal
   b. more signal and less noise.
   c. less signal and more noise.
   d. a steady oscillator drift.

5. When the internal noise generated by a receiver is increased:

   a. it has greater selectivity.
   b. the detector operates more efficiently.
   c. the sensitivity is reduced.
   d. it can be decreased by the tone control.

6. If your radio receiver receives but cannot separate a number of stations, it is said to be:

   a. bandspread. b. unselective. c. unmodulated. d. insensitive.

7. The ability of a receiver to separate signals close in frequency is called its:

   a. bandspread. b. sensitivity. c. IF separation. d. selectivity.

8. A receiver with high selectivity has:

   a. wide bandwidth. b. wide tuning range. c. narrow bandwidth. d. narrow tuning range.

9. If you have two radio receivers and "A" can separate stations well while "B" tends to receive more than one station at any tuning point then:

   a. A is more powerful than B.
   b. A is more sensitive than B.
   c. A is more selective than B.
   d. A is less sensitive than B.

10. For reception of AM signals:

   a. RF gain must be set to "MAXIMUM".
   b. BFO must be "ON".
   c. AF gain must be "OFF".
   d. BFO must be "OFF".

11. A detector for full carrier amplitude modulated (AM) signals:

   a. can clearly resolve SSB signals.
   b. is located before the crystal filter.
   c. needs no beat frequency oscillator.
   d. is a type of mixer stage.

12. A simple detector of AM signals uses basically the same process as a:

   a. power supply rectifier.
   b. transmitter modulator.
   c. receiver mixer.
   d. filter capacitor.

13. If a BFO signal of 456 KHz is applied to the detector of a receiver which has a 455 kHz IF, the output of the detector will be:

a. at audio frequency.
b. at signal frequency.
c. at IF frequency.
d. zero.

14. The beat frequency oscillator of a superheterodyne receiver operates on a frequency nearest to that of the:

a. RF amplifier. b. audio amplifier. c. first oscillator. d. IF stage.

15. To receive morse code (A1) signals, a BFO is employed in a superhet receiver in order to:

a. produce intermediate frequency signals.
b. beat with the local oscillator signal to produce sidebands.
c. produce an audio tone to beat with the IF signal.
d. beat with the IF signal to produce an audio tone.

16. Which of the following modes of transmission is usually detected with a product detector?

a. power modulation
b. double sideband full carrier
c. amplitude modulation
d. single sideband suppressed carrier

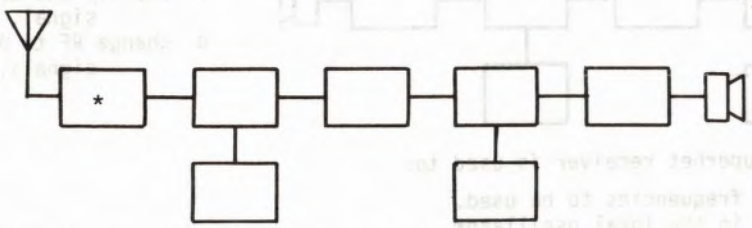
17. The BFO and product detector are stages in a receiver used to receive:

a. tone modulated CW.
b. amplitude modulation.
c. single sideband full carrier.
d. single sideband suppressed carrier.

18. A superhet receiver designed for SSB reception must have a BFO (beat frequency oscillator) because:

a. the suppressed carrier must be replaced for detection.
b. it phases out the unwanted sideband signal.
c. it reduces the passband of the IF stages.
d. it beats with the received carrier to produce the other sideband.

19. The stage marked with an asterisk(*) is the:



a. RF amplifier.
b. mixer.
c. IF amplifier.
d. detector.

20. Which function best describes the operation of an RF amplifier in a superheterodyne receiver?

a. beat RF with local oscillator signal.
b. amplify any signal tuned, at the one frequency.
c. oscillates to produce a signal in the audio range.
d. amplify signals at the tuned frequency.

21 Which stage of a receiver has its input and output circuits tuned to the received frequency?

a. the RF amplifier
b. the local oscillator
c. the intermediate frequency amplifier
d. the detector

22. Adding an RF stage ahead of the mixer stage in a superheterodyne receiver:

a. enables the receiver to tune a greater frequency range.
b. means no BFO stage is needed.
c. makes it possible to receive SSB signals.
d. increases the sensitivity of the receiver.

23. Which two stages in a superhet receiver have input tuned circuits tuned to the same frequency?

a. RF and IF
b. IF and local oscillator
c. RF and first mixer
d. RF and local oscillator

24. Sharply tuned circuits in a receiver RF amplifier:

a. reduce the strength of image signals.
b. overload the IF stages.
c. reduces the selectivity.
d. produce less receiver drift.

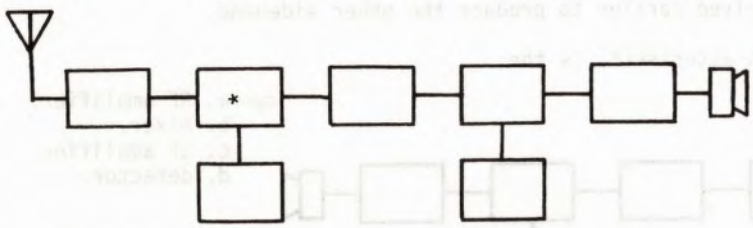
25. A signal voltage at 21 MHz appears at the input of the first stage in a superheterodyne receiver. A magnified form of the input signal is delivered from the output of the first stage. This first stage is called:

a. the mixer stage.
b. the first IF stage.
c. the local oscillator.
d. the RF amplifier.

26. Which stage of a superheterodyne receiver has a tuneable input stage and a fixed tuned output stage?

a. radio frequency amplifier
b. mixer stage
c. intermediate frequency amplifier
d. local oscillator

27. The purpose of the stage marked with an asterisk (*) is to:



a. amplify signals at the IF.
b. produce IF signals.
c. amplify the antenna signal.
d. change RF to AF signals.

28. The mixer stage of a superhet receiver is used to:

a. allow a number of IF frequencies to be used.
b. compensate for drift in the local oscillator.
c. remove image signals from the receiver.
d. change the frequency of incoming signals to the IF.

29. The mixer stage of a superheterodyne receiver:

a. produces spurious signals.
b. produces an intermediate frequency.
c. acts as a buffer stage.
d. demodulates SSB signals.

30. When a signal frequency and an oscillator frequency are applied to a mixer stage, the output contains these two frequencies as well as:

a. their product frequencies.
b. the result of their division.
c. their sum and difference.
d. twice the IF frequency.

31. If a 7 MHz signal frequency and a 16 MHz oscillator frequency are applied to the input of a mixer stage of a superhet receiver, the output will contain the input frequencies and frequencies of:

a. 8 and 9 MHz. b. 7 and 9 MHz. c. 9 and 23 MHz. d. 3.5 and 9 MHz.

32. Which stages of a superheterodyne receiver must be tunable to receive a band of frequencies?

a. the RF amplifiers
b. the mixer and first IF
c. RF amplifier/s and mixer
d. RF amp. mixer, and local oscillator

33. Selectivity in a superhet communications receiver is achieved mostly in the:

a. first oscillator. b. mixer. c. IF amplifier. d. audio stage.

34. In a superheterodyne receiver the stage next after the mixer:

a. amplifies the intermediate frequency signal.
b. demodulates the AF component from the IF carrier.
c. builds up the audio signal to loudspeaker level.
d. improves the audio frequency response.

35. The input and output tuned circuits of an AM superhet's IF amplifier are:

a. very broad in frequency response.
b. tuned to the same frequency.
c. the same as the RF tuned circuit.
d. not related in frequency.

36. In a superheterodyne receiver the intermediate frequency amplifier operates at:

a. bandswitched frequencies.
b. the audio output frequency.
c. the first oscillator frequencies.
d. one frequency band.

37. Common IF frequencies are:

a. 5 and 10 MHz.
b. 540 and 1600 kHz.
b. 455 kHz and 10.7 MHz.
d. 3.5 and 7 MHz.

38. In a communications receiver a crystal filter would be located in:

a. the local oscillator.
b. the IF strip.
c. the power supply.
d. the BFO.

39. Selectivity can be increased in a superhet receiver design by:

a. using a crystal filter in the early IF stages.
b. increasing the voltage applied to the IF stage.
c. reducing the number of IF stages.
d. using a product detector stage.

40. To receive SSB signals at best strength, a selective receiver's IF should be at the centre of:

a. the frequency of the suppressed carrier.
b. the frequency of the sideband.
c. the carrier and reduced sideband.
d. both sidebands.

41. Which of the following is meant by the abbreviation AGC?

a. attenuating gain capacitor
b. automatic gain control
c. anode-grid capacitor
d. amplified grid conductance

42. In a superhet receiver with AGC, as the strength of an incoming signal increases, the AGC:

a. reduces receiver gain.
b. increases receiver gain.
c. distorts the signal.
d. introduces limiting.

43. As AGC is applied to RF and IF stages, the gain of those stages will:

a. remain the same.
b. both decrease.
c. both increase.
d. vary independently in gain.

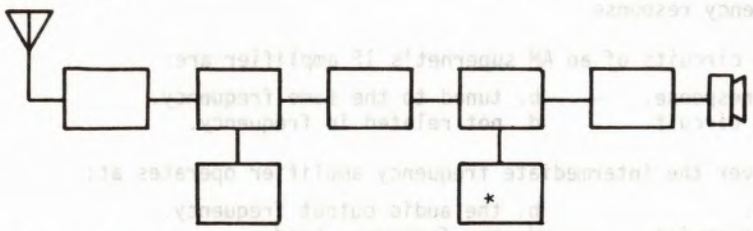
44. Bias voltage for the AGC in an AM superhet receiver is obtained from:

a. small dry cells.
b. the detector stage.
c. a low voltage power supply.
d. the mixer stage.

45. The AGC circuit in a Superhet receiver is usually applied to:

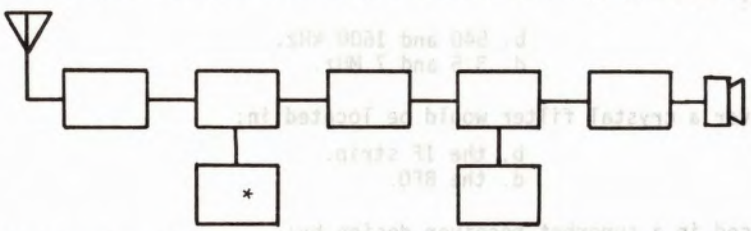
a. the audio stage.
b. the mixer stage.
c. the power supply.
d. RF and IF stages.

46. In the diagram below, of a superheterodyne receiver, what is the function of the stage marked (*)?



a. first audio stage
b. beat frequency oscillator
c. convertor
d. second detector

47. The stage of a superheterodyne receiver shown by an asterisk (*) is the:



a. RF amplifier.
b. local oscillator.
c. mixer.
d. IF amplifier.

48. The first oscillator in a good quality superhet receiver is sturdily built, uses a regulated supply voltage, and has temperature-compensated components. This is to achieve:

a. stability.
b. sensitivity.
c. selectivity.
d. bandspread.

49. The local oscillator stage of a superheterodyne receiver may have its stability improved by:

a. increasing the plate voltage.
b. using a voltage regulated supply.
c. replacing a valve.
d. fitting a parasitic suppressor.

50. The station-tuning knob of a superhet receiver (with no RF amplifier) changes the tuned frequency of:

a. the aerial input only.
b. the intermediate frequency amplifier coils.
c. the oscillator and aerial input.
d. the input to the detector.

51. A superhet receiver, once tuned to a given frequency, drifts in tuning to a nearby frequency. The fault would most likely be found in the:

a. oscillator stage.
b. RF amplifier.
c. mixer stage.
d. IF amplifier.

52. A single conversion superhet receiver whose intermediate frequency is 9 MHz is tuned to receive a signal of 13 MHz. The oscillator frequency is most likely to be:

a. 4 MHz.
b. 9 MHz.
c. 13 MHz.
d. 18 MHz.

53. An audio amplifier is necessary in a communications receiver because:

a. signals leaving the detector are too weak.
b. the carrier frequency must be replaced.
c. the signal requires demodulation.
d. RF vibrations are not heard by the human ear.

54. The output transformer of a receiver is fitted to:

a. step up the audio gain.
b. protect the loudspeaker from high currents.
c. improve the audio tone.
d. match the impedance of the amplifier to the speaker.

55. The number of intermediate frequencies in a single conversion superheterodyne receiver is:

a. none.
b. one.
c. two.
d. three.

56. If the BFO is counted, then a single conversion tunable superheterodyne receiver has:

a. one oscillator.
b. two oscillators.
c. three oscillators.
d. four oscillators.

57. A single conversion superheterodyne receiver with a 9 MHz IF has an oscillator operating at 16 MHz. The frequency it is tuned to is:

a. 18 MHz.
b. 16 MHz.
c. 7 MHz.
d. 9 MHz.

58. A superheterodyne receiver receives an incoming signal of 3540 kHz and the local oscillator produces a signal of 3995 kHz. To which frequency should the IF be tuned?

a. 455 kHz
b. 455 MHz
c. 3995 kHz
d. 3540 kHz

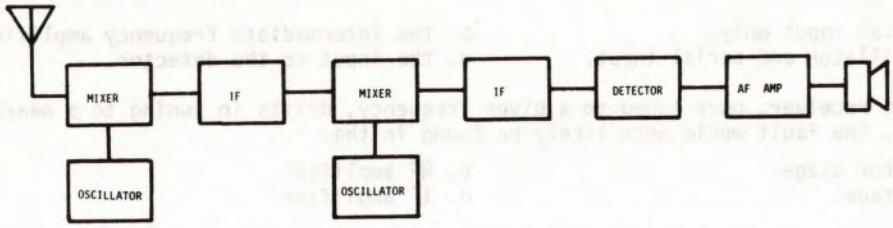
59. A double conversion receiver designed for SSB reception has a beat frequency oscillator and:

a. one IF stage and one local oscillator.
b. two IF stages and one local oscillator.
c. two IF stages and two local oscillators.
d. two IF stages and three local oscillators.

60. The advantage of a double conversion receiver over a single conversion receiver is that it:

a. does not drift off frequency.
b. produces a louder audio signal.
c. suffers less from image interference.
d. is a more sensitive receiver.

61. This block diagram represents a:

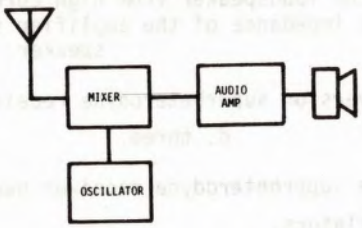


a. triple conversion receiver.
b. single conversion receiver.
c. double conversion receiver.
d. direct conversion receiver.

62. A 3.5 - 4.0 MHz single conversion superheterodyne receiver has additional RF, oscillator and mixer stages added to allow it to tune 21.0 - 21.5 MHz. This converter would then make the receiver a:

a. direct conversion receiver.
b. tuned radio frequency receiver.
c. single conversion superhet.
d. double conversion superhet.

63. This block diagram represents



a. superheterodyne receiver.
b. single conversion receiver.
c. dual conversion receiver.
d. direct conversion receiver.

64. The number of intermediate frequency stages in a direct conversion receiver is:

a. nil. b. one. c. two. d. three.

65. In a direct conversion receiver most amplification takes place:

a. in the RF coils.
b. in the audio stage.
c. before detection.
d. in the mixer.

66. A direct conversion receiver does not require a beat frequency oscillator because:

a. it is not designed to receive CW and SSB.
b. the signal received makes the mixer oscillate.
c. the oscillator itself is the BFO.
d. feedback occurs in the audio amplifier.

67. In a direct conversion receiver, detection occurs in the:

a. oscillator. b. mixer. c. audio preamplifier. d. audio amplifier.

68. A CW transmission of 3500.8 kHz is received by a direct conversion receiver whose oscillator is running at 3500.0 kHz. The tone of CW sound produced by the receiver is:

a. 800 Hz. b. 1600 Hz. c. 3500 Hz. d. 7000.8 kHz.

69. In a direct conversion receiver the mixer stage operates as a:

a. product detector. b. oscillator. c. audio amplifier. d. frequency filter.

70. In a direct conversion receiver tuned to receive a lower sideband SSB signal, the oscillator frequency is:

a. slightly higher than the suppressed carrier.
b. 455 KHz away from the tuned frequency.
c. exactly the same as the suppressed carrier frequency.
d. slightly below the tuned frequency.

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

AMPLITUDE MODULATION

1. The frequencies of human speech are usually stated in:

   a. hertz and kilohertz.
   b. kilohertz and megahertz.
   c. megahertz only.
   d. hertz only.

2. The bandwidth of a DSB full carrier amplitude modulated signal is approximately:

   a. the same as the speech bandwidth.
   b. twice the speech bandwidth.
   c. three times the speech bandwidth.
   d. many times the speech bandwidth.

3. In a DSB full carrier AM transmission, the carrier is radiated:

   a. only when the operator speaks into the microphone.
   b. whether the operator speaks into the microphone or not.
   c. only when the modulation percentage reaches 100%.
   d. only when the operator is not speaking into the microphone.

4. Which of the following would be produced by a DSB full carrier AM transmission:

   a. two sidebands and full carrier.
   b. two sidebands and no carrier.
   c. one sideband and full carrier.
   d. one sideband and no carrier.

5. The bandwidth occupied by an amateur DSB full carrier amplitude modulated transmission of speech is approximately:

   a. 1 kHz.
   b. 2 kHz.
   c. 6 kHz.
   d. 20 kHz.

6. The superimposing of some form of message onto a radio frequency is known as:

   a. detection.
   b. modulation.
   c. mixing.
   d. transmitting.

7. With respect to a correctly transmitted amplitude modulated transmission, which statement below is correct?

   a. there is only one sideband
   b. the frequency changes in step with speech
   c. there are instants where no carrier is sent
   d. when modulation stops only carrier is sent

8. The superimposing of speech onto a transmitted radio frequency results in:

   a. interrupted continuous wave transmission.
   b. tone modulated carrier.
   c. voice modulated carrier.
   d. a single frequency being transmitted.

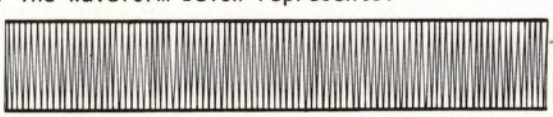
9. A transmission amplitude modulated by;

   a. any tone occupies the same bandwidth.
   b. a 2 kHz tone occupies more bandwidth than a 3 kHz tone.
   c. a tone of over 3kHz would be overmodulated.
   d. a 2 kHz tone occupies more bandwidth than a 1 kHz tone.

10. The form of transmission in which the amount of energy imposed on a carrier changes in step with audio frequencies is known as:

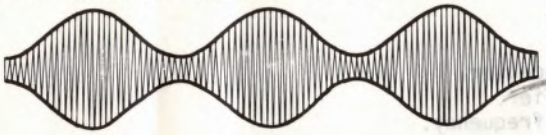
    a. amplitude modulation.
    b. frequency modulation.
    c. interrupted carrier.
    d. morse code.

11. The waveform below represents:



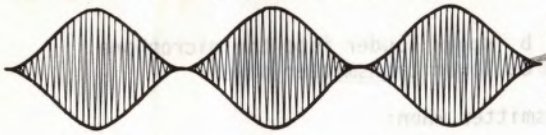
    a. carrier wave of a single frequency (A0).
    b. amplitude modulated speech (A3).
    c. frequency modulated speech (F3).
    d. an overmodulated AM signal.

12. The waveform diagram below represents:



a. an overmodulated AM transmission (A3A).
b. interrupted continuous wave (A1).
c. undermodulated AM transmission (A3A).
d. single sideband suppressed carrier (A3J).

13. The waveform diagram below represents:



a. an undermodulated AM transmission (A3A).
b. a 100% modulated transmission (A3A).
c. an overmodulated AM transmission (A3A).
d. a 50% modulated AM transmission (A3A).

14. The modulation envelope of a double sideband full carrier amplitude modulated (AM) transmission:

a. regularly changes the transmission frequency.
b. resembles the imposed audio modulating frequency.
c. is produced by the transmitter oscillator.
d. represents the carrier frequency.

15. Which signal in an amplitude modulated transmitter (A3A) most closely resembles the modulation envelope?

a. the oscillator signal
b. the buffer amplifier signal
c. the speech amplifier signal
d. the multiplier signal

16. A 100% modulated (A3A) AM signal, compared with the same carrier unmodulated:

a. carries more power.
b. carries less power.
c. has more power in the sidebands than in the carrier.
d. has as much power in the sidebands as in the carrier.

17. What maximum audio power should be produced by the modulator stage of a 10-watt AM transmitter which uses high level modulation?

a. 15 watts
b. 2 watts
c. 5 watts
d. 10 watts

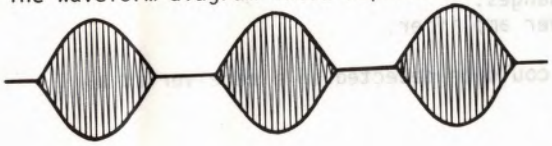
18. In a valve amplitude modulated (A3A) transmitter as normal audio is applied to the modulator stage the PA plate current will:

a. rise.
b. remain constant.
c. fall.
d. drop to zero.

19. For most efficient amplitude modulation of an amateur transmitter the modulation percentage should be:

a. as low as possible.
b. as high as possible.
c. no more than 50%.
d. as near to 100% as possible.

20. The waveform diagram below represents:



a. a carrier wave of a single frequency (A0).
b. a 100% amplitude modulated AM transmission.
c. overmodulated AM transmission.
d. single sideband suppressed carrier (A3J).

21. Overmodulation of a double sideband full carrier amplitude modulated (AM) transmission will produce:

a. de-tuning of the antenna and feedline.
b. greater signal strength measured at a receiver.
c. decreased efficiency of the power amplifier.
d. additional sidebands either side of the frequency.

22. To reduce the percentage modulation in an amplitude modulated transmission to below 100%, the operator should:

a. increase audio gain.
b. speak louder into the microphone.
c. reduce modulator power.
d. lower transmitter power.

23. High level modulation is applied to a transmitter when:

a. modulation percentage exceeds 100%.
b. modulator power is more than half transmitter DC input.
c. audio gain in the speech amplifier causes distortion.
d. modulation is applied to the power amplifier stage.

24. A high level AM modulator unit is coupled to the power amplifier stage of a transmitter by a:

a. modulation index.
b. modulation meter.
c. speech amplifier stage.
d. modulation transformer.

25. The modulation of a 10 watt transmitter power amplifier with 5 watts of modulator power would be termed:

a. overmodulation.
b. low level modulation.
c. undermodulation.
d. high level modulation.

26. If an AM transmitter is modulated at an early stage, then the RF amplifiers which follow the modulator must:

a. be operated in class C.
b. be linear.
c. also be modulated.
d. have filtering.

27. When a power amplifier is correctly modulated by a modulator using high level modulation the:

a. RF power increases at speech peaks.
b. power amplifier is off without speech.
c. carrier is emitted at half power.
d. bandwidth is lower at high frequencies.

28. Amplitude modulation of a transmitter stage other than the power amplifier is called:

a. super modulation.
b. low level modulation.
d. dynamic modulation.
d. efficiency modulation.

29. The modulation level in an AM transmitter may be measured:

a. by observing a waveform pattern on a cathode ray oscilloscope.
b. with a standing wave ratio meter.
c. by observing the oscillator frequency changes.
d. with a dip oscillator coupled to the power amplifier.

30. Overmodulation in a transmitted AM signal could be detected in a receiver at a sufficient distance by:

a. listening for distortion on voice peaks.
b. observing the receiver's meter.
c. by carefully comparing volume of audio recovered.
d. by tuning the receiver on either side of the frequency.

31. When operating in a mobile capacity which of these microphones would be most suitable?

a. crystal b. moving coil c. condenser d. ribbon

32. The type of microphone which operates on the principle of a coil moving within a magnetic field is:

a. dynamic. b. crystal. c. carbon. d. ribbon.

33. Which of the following components could be used as a dynamic microphone?

a. loudspeaker b. capacitor c. resistor d. crystal earpiece

34. This symbol represents a:

a. loudspeaker.
b. electric bell.
c. earpiece.
d. microphone.

35. A carbon microphone operates on a similar principle to:

a. variable resistor.
b. variable capacitor.
c. variable inductor.
d. fixed resistor.

36. In a carbon microphone, a wave of high air pressure from speech would:

a. expand the granules.
b. increase the current.
c. amplify the capacitance.
d. reduce the inductance.

37. Of the following, which microphone has no internal DC path between its terminals?

a. carbon. b. dynamic. c. crystal. d. ribbon.

38. Which principle governs the operation of a crystal microphone.

a. mutual induction.
b. capacitative reactance.
c. piezoelectric effect.
d. variable resistance.

39. Which of the following microphones has the highest impedance?

a. crystal b. moving coil c. ribbon d. carbon

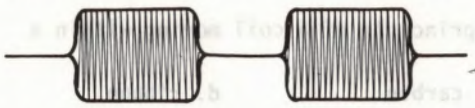
40. The principle of operation of a condenser (capacitor) microphone depends on the:

a. effect of distance change between two plates.
b. change in strength of a magnetic field.
c. flow of current through a dielectric.
d. bending of a piezoelectric material.

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

CODE TRANSMISSION

1. Which mode of transmission would be represented by the waveform diagram below?



a. frequency modulation (F3)
b. amplitude modulation (A3)
c. interrupted continuous wave (A1)
d. single sideband suppressed carrier (A3J)

2. Morse code is usually transmitted on air as:

a. interrupted carrier.
b. voice modulated carrier.
c. continuous carrier.
d. a series of clicks.

3. When keying a transistorised morse code transmitter at the oscillator stage, it is difficult to avoid:

a. high voltages exposed at the key.
b. changes in frequency at "key down".
c. slow drift in oscillator frequency.
d. sending carrier when the key is off.

4. A method of keying a morse code transmitter that would allow the receiver to operate when the key is not closed would be to:

a. key the power amplifier only.
b. key the oscillator stage.
c. provide a switch at the key.
d. key an intermediate stage only.

5. When keying the power amplifier of a morse code transmitter care should be taken to ensure that:

a. the key does not change the RF output.
b. the oscillator does not operate while the key is up.
c. extra power drawn does not change the oscillator frequency.
d. RF does not reach the transmitter antenna.

6. It is usually desirable to use a keying relay when operating a valve-type amateur transmitter on CW (A1) because:

a. it avoids high voltages on the morse key.
b. it makes possible high speed operation.
c. key clicks will be eliminated.
d. the oscillator is not "pulled" off frequency.

7. Which keying method used in a valve power amplifier would result in unsatisfactory morse code transmission?

a. anode keying
b. cathode keying
d. grid keying
d. heater keying

8. The use of a keying relay is advisable when keying:

a. at a high keying speed.
b. the power supply to a valve power amplifier.
c. the transmitter using long leads.
d. the oscillator stage of a transistor transmitter.

9. Key clicks heard from a morse code transmitter, at a distant receiver, are the result of:

a. sparks emitting RF from the key contacts.
b. changes in oscillator frequency on keying.
c. power supply hum modulating the carrier.
d. too sharp rise and decay times of the carrier.

10. In a morse code transmission local RF interference (RF clicks) is produced by:

a. poor shaping of the waveform.
b. shift in frequency when keying the transmitter.
c. sparking at the key contacts.
d. sudden movement in the receiver loudspeaker.

11. The difference between key clicks and RF clicks is that:

a. RF clicks are not heard by distant stations.
b. "pulling" the oscillator frequency produces key clicks.
c. RF clicks are produced at the power amplifier.
d. key clicks are produced at the morse key.

12. RF clicks are:

a. detected only on nearby receivers.
b. frequency changes in the oscillator.
c. produced in the RF power amplifier.
d. sounds heard from key movement.

13. Key clicks are:

a. sounds made by a morse key.
b. signals heard away from the transmit frequency.
c. brief changes in transmitter frequency.
d. noises produced by a keying relay.

14. Before sudden frequency changes (chirps) in a morse code transmitter can be effectively treated:

a. the oscillator must be disconnected.
b. hum must be removed from the power supply.
c. key clicks must be eliminated from the transmitter.
d. the station receiver must be turned off.

15. Keying an amplifier stage momentarily later than the oscillator will:

a. prevent key clicks being radiated.
b. prevent "the signal sounding chirpy".
c. prevent sudden power drain in the transmitter.
d. shape the keyed pulses from the transmitter.

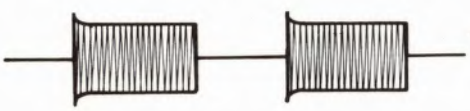
16. Key clicks from a morse code transmitter can be avoided by using components which:

a. regulate the voltage on the power amplifier.
b. prevent the oscillator from changing frequency.
c. shaping the rise and fall time of RF power.
d. prevent sparking at the key.

17. RF clicks can be suppressed by:

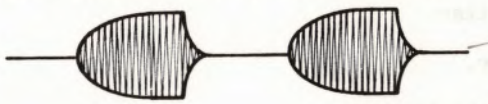
a. turning the receiver down.
b. inserting a choke and a capacitor at the key.
c. regulating the oscillator supply voltage.
d. using a choke in the RF power output.

18. The oscilloscope waveform display below shows that the morse code transmitter:



a. does not have a regulated power supply.
b. is producing key clicks.
c. is making a well shaped signal.
d. is varying in frequency.

19. A wave envelope display on a cathode ray oscilloscope monitoring a morse code transmitter, as shown below, would be the result of:

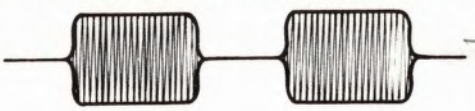


a. changes in oscillator frequency.
b. too much capacitance or resistance in shaping circuits.
c. the generation of key clicks in the power amplifier.
d. spark generation at the key contacts.

20. A suitable method for examining the quality of signal from a morse code transmitter would be to:

a. observe waveforms on a cathode ray oscilloscope.
b. key an audio oscillator at the same time.
c. leave the station receiver running.
d. use an RF powered audio oscillator.

21. The oscilloscope waveform diagram below shows a morse code signal which:



a. contains key clicks.
b. is a well shaped signal.
c. is very "soft sounding".
d. is modulated with hum.

SINGLE SIDEBAND TRANSMISSION.

1. Which of the following designations apply to the type of transmission commonly termed "SSB"?

   a. single sideband full carrier
   b. single sideband suppressed carrier
   c. double sideband full carrier
   d. double sideband suppressed carrier

2. Which of the following statements is true of an amplitude modulated single sideband suppressed carrier transmission?

   a. part of the signal carries no modulation
   b. the modulation is found about two centre frequencies
   c. the entire signal carries modulation
   d. the signal has two carrier frequencies

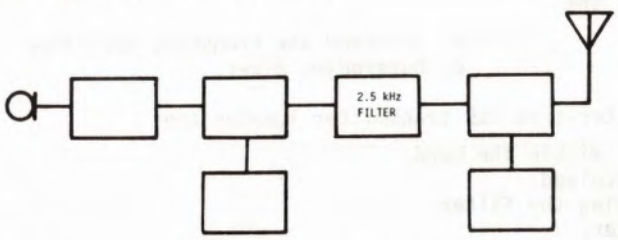
3. What mode of transmission would be produced in a system where audio and RF are mixed in a balanced modulator, and the output passed through a filter which has only half the bandwidth of its input signal?

   a. single sideband suppressed carrier
   b. double sideband full carrier
   c. single sideband full carrier
   d. double sideband suppressed carrier

4. Which of the following is a method for generating single sideband suppressed carrier (A3J) transmissions:

   a. carrier insertion.
   b. filter system.
   c. cathode keying.
   d. plate modulation.

5. The block diagram below illustrates:



   a. A DSB transmitter.
   b. an AM receiver.
   c. a frequency meter.
   d. a SSB transmitter.

6. What part of an amplitude modulated signal is suppressed by the balanced modulator?

   a. one sideband
   b. both sidebands
   c. carrier and one sideband
   d. carrier

7. In a filter system single sideband suppressed carrier transmitter, it is found that carrier is appearing at the output. Which stage should be suspected as faulty?

   a. the filter
   b. the carrier oscillator
   c. the balanced modulator
   d. the audio preamplifier

8. The output of a correctly adjusted balanced modulator of a single sideband suppressed carrier transmitter would contain:

   a. one sideband and no carrier.
   b. carrier and one sideband.
   c. no carrier and both sidebands.
   d. both sidebands and carrier.

9. Which of the following stages in an SSB transmitter suppresses the carrier?

   a. RF amplifier
   b. double sideband filter.
   c. variable frequency oscillator
   d. balanced modulator

10. The frequency bandwidth of a filter in an SSB voice transmitter is nearest to:

a. 455 kHz. b. 20 kHz. c. 2.7 kHz. d. 1 kHz.

11. The band of frequencies passed by a filter of an SSB transmitter is:

a. the same width as the speech frequencies required.
b. as wide as the difference between any two carrier crystals.
c. the same as the range of the variable frequency oscillator.
d. the same width as the carrier frequency.

12. In an SSB transmitter, which stage ensures that only one sideband proceeds towards the power amplifier?

a. balanced modulator. b. variable frequency oscillator.
c. speech amplifier. d. filter.

13. In a filter system SSB transmitter, a change from upper sideband to lower sideband on the same frequency band is achieved by changing the frequency of the:

a. variable frequency oscillator. b. balanced mixer.
c. audio amplifier. d. carrier oscillator.

14. In a filter system SSB transmitter the radio frequency fed to the balanced modulator, is produced by:

a. the audio amplifier. b. the carrier oscillator.
c. the heterodyne oscillator. d. the filter stage.

15. The frequency entering the heterodyne mixer from the filter of an SSB transmitter is the same as the frequency of the:

a. audio amplifier. b. intermediate frequency amplifier.
c. linear amplifier. d. heterodyne mixer.

16. The carrier oscillator in a filter-type SSB transmitter locates the:

a. frequency of the final signal within the band.
b. range of audio frequencies received.
c. frequency of the signal entering the filter.
d. tuning range of the transmitter.

17. In a filter type SSB transmitter, a 9 MHz signal appears after the filter. The stage at which its frequency would be changed to 3.55 MHz is the:

a. linear amplifier. b. heterodyne mixer.
c. carrier oscillator. d. balanced modulator.

18. The signal from an SSB transmitter is found to drift in frequency without any change in quality or strength. The faulty stage would be found:

a. between balanced modulator and filter. b. to be the carrier oscillator.
c. before the balanced modulator. d. after the filter.

19. If a 9 MHz SSB signal leaving the filter of an SSB transmitter is to be changed to 3.5 MHz, the heterodyne oscillator should operate at:

a. 3.5 MHz. b. 5.5 MHz. c. 6 MHz. d. 9 MHz.

20. The SSB signal leaving the filter of an SSB transmitter is located at the transmitter frequency by mixing with a signal from:

a. the carrier oscillator. b. the variable frequency oscillator.
c. the audio amplifier. d. the linear amplifier.

21. Which stage of an SSB transmitter operates at the frequency of the transmitted signal?

a. the filter.
b. the variable frequency oscillator.
c. the carrier oscillator.
d. the linear amplifier.

22. An important feature of a linear RF amplifier is:

a. input and output waveforms must be different.
b. no distortion is introduced to the signal.
c. none of the input power should appear as heat.
d. that it should produce carrier in the absence of speech.

23. The stage of an SSB transmitter where RF power amplification takes place is the:

a. linear amplifier.
b. audio amplifier.
c. filter.
d. variable frequency oscillator.

24. Which stage of a filter system SSB transmitter would be at fault if a transmission generated harmonics of the output frequency?

a. the carrier oscillator
b. the balanced modulator
c. the heterodyne mixer
d. the linear amplifier

25. The principal feature necessary in design of an amplifier for raising the power level of a single sideband signal should be:

a. efficiency.
b. linearity.
c. power gain.
d. matching.

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

PROPAGATION.

1. The polarisation of an aerial is the:

a. direction of its radiated magnetic field b. direction of its radiated electric field.
c. length of the radiating element d. radiation angle.

2. Radio waves are given out from:

a. any wire which is carrying alternating current.
b. wires carrying direct current.
c. any object connected to a valve or transistor.
d. wires connected to a SWR bridge.

3. In the absence of reflections, bending or fading, radio waves:

a. follow the earth's curvature.
b. increase in strength as they get further away.
c. travel away from the antenna in straight lines.
d. move in a circular path.

4. Signals from a mobile station using a vertical whip aerial will normally be best received using a:

a. horizontal dipole. b. vertical ground plane.
c. horizontal ground plane. d. random length of wire.

5. A dipole antenna will emit a vertically polarized wave if it is:

a. too near to the ground. b. fed with the correct type of RF.
c. mounted vertically. d. parallel with the ground.

6. If an electromagnetic wave leaves an antenna vertically polarized, it will arrive on a receiving antenna, by ground wave:

a. vertically polarized. b. polarized in any plane.
c. polarized at right angles to original. d. horizontally polarized.

7. In a dipole aerial, the polarization of the electromagnetic waves it emits will be:

a. at right angles to the direction of the wire.
b. dependent on the angle of radiation.
c. parallel to direction of the wire.
d. same as the direction of the feedline.

8. Compared with a horizontal antenna, a vertical antenna will receive a vertically polarized radio wave:

a. at greater strength. b. at weaker strength.
c. without any comparative difference. d. if the antenna changes the polarization.

9. In general for best reception of signals radiated from a horizontal yagi aerial the receiving aerial should be:

a. horizontal. b. vertical.
c. quarter wave ground plane. d. car "whip" aerial.

10. Skip distance is a term associated with signals from the ionosphere. Skip effects are due to:

a. reflection and refraction from the ionosphere.
b. selective fading of local signals.
c. high gain aerials being used.
d. local cloud cover.

11. Which type of atmosphere layers will best act to return signals to earth?

a. oxidised layers
b. heavy cloud layers
c. ionised layers
d. sun spot layers

12. The ionosphere:

a. is a magnetized belt around the earth.
b. consists of magnetized particles around the earth.
c. is formed from layers of ionized gases around the earth.
d. is a spherical belt around the earth.

13. The ionosphere is effective to a height of about:

a. 3 km.
b. 30 km.
c. 300 km.
d. 3000 km.

14. Which of the following makes possible the propagation of high frequency radio signals between Europe and Australia?

a. stratosphere
b. atmosphere
c. hydrogen layer
d. ionosphere

15. The distance between a transmitter and the point where the reflected wave reaches the earth's surface after making one "bounce" off the ionosphere is called the:

a. skip zone.
b. ionospheric prediction distance.
c. skip distance.
d. maximum usable frequency.

16. In radio frequency propagation the skip distance is the:

a. distance from the end of ground wave coverage to the point where signal first returns after refraction from the ionosphere.
b. distance covered by the ground wave.
c. distance from the transmitter to the point where the signal first returns after refraction from the ionosphere.
d. a maximum distance the signal is capable of travelling.

17. The skip distance of a sky wave will be greatest when the:

a. ionosphere is most densely ionized.
b. signal given out is strongest.
c. angle between ground and radiation is smallest.
d. polarization is vertical.

18. If the height of the reflecting layer of the ionosphere increases, the skip distance of a high frequency transmission:

a. stays the same.
b. decreases.
c. varies regularly.
d. becomes greater.

19. If we transmit a signal, the frequency of which is so high we no longer receive a reflection from the ionosphere, the signal frequency is above the:

a. speed of light.
b. sun spot frequency.
c. skip distance.
d. maximum usable frequency.

20. Long distance propagation will be possible on 28 MHz if the maximum usable frequency at the time is:

a. 5 MHz.
b. 10 MHz.
c. 20 MHz.
d. 30 MHz.

21. When the transmitted frequency is above the maximum usable frequency for a given path:

a. the ground wave is absorbed after a short distance.
b. long distance communication is possible.
c. the antenna fails to radiate an electromagnetic wave.
d. no reception on that frequency by sky wave is possible.

22. The maximum usable frequency of the ionosphere for a given path is the:

a. the frequency below which reflections do not occur.
b. maximum frequency at which a certain transmitter power is used.
c. greatest number of times it can be used.
d. greatest frequency at which reflection occurs.

23. A line of sight transmission between two stations uses mainly the:

a. ionosphere. b. troposphere. c. sky wave. d. ground wave.

24. Local radio contacts are made by:

a. ground wave signals. b. local sound waves.
c. sky waves. d. ionosphere waves.

25. The ground wave emitted by a transmitting antenna:

a. is stronger at lower frequencies.
b. travels horizontally from the antenna,
c. travels as far as the sky wave.
d. is used for intercontinental amateur communication.

26. High frequency radio signals are less likely to be absorbed by the lower layers of the atmosphere:

a. if there are no clouds. b. if the antenna is higher.
c. during summer. d. during the night.

27. The distance travelled by ground waves in air;

a. is the same for all frequencies. b. is less at higher frequencies.
c. is more at higher frequencies. d. depends on the maximum usable frequency.

28. The sky wave from a radio transmitter:

a. always follows a curved path. b. cannot be heard beyond the visible horizon.
c. is reflected from clouds. d. can be reflected by the ionosphere.

29. The radio wave which follows a path from the transmitter to the ionosphere and back to earth is known correctly as the:

a. sky wave. b. skip wave. c. surface wave. d. F layer.

30. Reception of high frequency radio waves beyond 4 000 km is generally possible by:

a. skip wave. b. surface wave. c. ground wave. d. sky wave.

31. The ability of the ionosphere to reflect high frequency radio waves:

a. increases during daylight. b. depends on atmospheric temperature.
c. remains constant. d. is better above a land surface.

32. 28 MHz radio signals are more likely to be heard over great distances:

a. if the transmitter power is reduced. b. during daylight hours.
c. only during the night. d. at full moon.

33. The number of high frequency bands open to long distance communication at any time depends on:

a. the frequency at which reflection stops occurring.
b. the number of frequencies the receiver can tune.
c. the power being radiated by the transmitting station
d. the height of the transmitting antenna.

34. Sky wave communication between radio stations is not possible:

a. at night-time.
b. below the maximum usable frequency.
c. between stations more than 4.000 km apart.
d. above the maximum usable frequency.

35. If sky wave communication between stations is possible on a frequency of 21 MHz then it should also be possible to communicate:

a. on 14 MHz.
b. on 28 MHz.
c. on 52 MHz.
d. on 144 MHz.

36. Fading of sky wave signals is most likely to occur:

a. during summer.
b. during high sunspot activity.
c. when weather patterns are changing.
d. when they follow a polar path.

37. When a transmitted radio signal reaches a station by a one-hop and two-hop skip path, the small changes in the ionosphere can cause:

a. consistently stronger signals.
b. a change in the ground wave signal.
c. variations in signal strength.
d. consistent fading of received signal.

38. The usual effect of ionospheric storms is to:

a. increase the maximum usable frequency.
b. cause a fade-out of sky-wave signals.
c. produce extreme weather changes.
d. prevent communications by ground wave.

39. Changes of intensity in a received sky wave radio signal are called.

a. ground wave losses.
b. modulation losses.
c. fading.
d. sunspots.

40. Although high frequency signals may be received from a distant station by sky wave at a certain time, it may not be possible to hear them an hour later. This may be due to:

a. changes in the ionosphere.
b. shading of the earth by clouds.
c. changes in atmospheric temperature.
d. absorption of the ground wave signal.

41. Intercontinental contacts on 28 MHz would be possible if:

a. at night the ionosphere was much reduced in strength.
b. in the day the static level was low.
c. there had been intense sun spot activity to strengthen the ionosphere.
d. both transmitter and receiver aerials were cross polarized.

42. In mid summer the presence of static is likely to limit communication on the:

a. 80 m band.
b. 15 m band.
c. 11 m band.
d. 10 m band.

43. The ability of the ionosphere to reflect high frequency radio signals depends on:

a. upper atmosphere weather conditions.
b. the power of the transmitted signal.
c. the receiver sensitivity.
d. the amount of solar radiation.

44. Regular changes in the ionosphere occur approximately every 11:

a. days.
b. months.
c. years.
d. centuries.

45. Communication on the 80 metre amateur band is generally most difficult during:

a. evening in summer.
b. evening in winter.
c. daytime in summer.
d. daytime in winter.

46. Radio communication on 21 MHz using the ionosphere during a sunspot maximum is most likely:

a. in spring. b. in summer. c. in autumn. d. in winter.

47. Ionospheric propagation on the high frequency bands is better in summer than winter because:

a. antenna temperature affects radiation properties.
b. solar radiation ionizes the upper layers.
c. summer weather is more stable.
d. ground waves travel further.

48. Sky wave communication on 21 MHz during a sunspot maximum is most likely:

a. during daylight. b. in the mornings.
c. in the evenings. d. at night.

49. The amount of static appearing on the 80 metre band is greatest during:

a. spring. b. night time. d. autumn. d. daytime.

50. Long distance high frequency propagation is better on 28 MHz during daylight hours because of:

a. less absorption in the lower atmosphere.
b. higher temperatures.
c. solar radiation acting on the ionosphere.
d. less disturbance of the upper atmosphere.

TRANSMISSION LINES.

1. When energy from a transmitter is transferred to the antenna without losses due to reflection the system is said to be:

a. matched. b. balanced. c. lossless. d. radiating.

2. In a correctly matched transmitter-feedline-antenna system:

a. only the feedline radiates radio waves.
b. the feedline and antenna radiate radio waves.
c. only the antenna radiates radio waves.
d. the entire system does not lose any energy.

3. Which of the following statements is true only of unbalanced transmission lines?

a. one conductor is at ground potential. b. characteristic impedance is always high.
c. RF currents in it are equal and opposite. d. used for receiving only.

4. Which of the following statements about travelling and standing waves in aerial feedlines is correct?

a. travelling waves are the result of reflection.
b. standing waves deliver energy efficiently to the aerial.
c. travelling waves cause a high SWR.
d. standing waves are a result of reflection.

5. In a feedline-antenna system:

a. the feedline should carry standing waves.
b. standing waves should exist on the antenna.
c. the antenna should carry travelling waves only.
d. both parts should have standing waves.

6. The purpose of a transmission line is to:

a. produce standing waves in the line. b. carry RF power with minimum loss.
c. transmit radio waves into space. d. load a transmitter.

7. Another name for a transmission line is:

a. matching stub. b. vertical radiator.
c. feeder. d. balun.

8. The characteristic impedance of a transmission line is measured in:

a. SWR. b. henries. c. ohms. d. a ratio.

9. The characteristic impedance of a feedline:

a. is correct only for one frequency. b. depends on the RF power it carries.
c. can be tuned to a different value. d. does not change with frequency.

10. Compared with a 300 ohm transmission line, a 50 ohm transmission line will always:

a. deliver more RF to an antenna. b. have a lower characteristic impedance.
c. be more suitable for any transmitter. d. have smaller dimensions.

11. A transmission line is specified as 50 ohms. This refers to:

a. the DC resistance. b. the inductive reactance.
c. the characteristic impedance. d. the capacitative reactance.

12. If a pure resistance of 50 ohms is placed at the end of a length of 50 ohm transmission line:

a. all power is reflected back along the line.
b. the resistance will absorb all RF power reaching it.
c. standing waves will appear on the line.
d. the impedance of the line will change to 25 ohms.

13. A certain feedline is said to have a characteristic impedance of 75 ohms. This means that:

a. It has a DC resistance of 75 ohms.
b. It will deliver RF power efficiently to a 75 ohm load.
c. It will accept 150 volts DC at 2 amperes.
d. A half wavelength shorted at the end will measure 75 ohms.

14. If an antenna is correctly matched to a transmitter line the length of the transmission line:

a. should be an even number of half waves.
b. should be a full wavelength long.
c. should be an odd number of quarter wave.
d. will have no effect on the matching.

15. The impedance of a coaxial transmission line:

a. is correct for only one size of line.
b. changes with the frequency of RF it carries.
c. can be the same for different diameter line.
d. is greater for larger diameter line.

16. Coaxial feedlines:

a. may be bent around corners.
b. must be run in straight lines.
c. should carry current in the outer conductor.
d. are made of two spaced wires.

17. Coaxial feedlines correctly fitted between transmitter and antenna.

a. will always radiate RF energy from the outer conductor:
b. should not be bent around corners.
c. are unaffected by nearby metal objects.
d. will feed balanced currents directly to the antenna.

18. Coaxial feedline contains:

a. only one conductor.
b. two parallel conductors separated by spacers.
c. braid and insulation around a central conductor.
d. four or more conductors running parallel.

19. Twin lead TV feedline could be used:

a. only for reception.
b. for feeding antennas with a 300 ohm impedance.
c. for quarter wave vertical antennas.
d. as an emergency replacement for 75 ohm coaxial cable.

20. The usual characteristic impedance of parallel-conductor TV feedline:

a. 50 ohms.
b. 75 ohms.
d. 300 ohms,
d. 600 ohms,

21. Balanced transmission line may radiate RF if it:

a. is more than one wavelength long.
b. carries too much RF power.
c. is connected to an antenna.
d. runs against metallic objects.

22. Balanced transmission line:

a. has one conductor inside the other.
b. is made of two parallel wires.
c. carries RF current on one wire only.
d. is made of one conductor only.

23. The reason that an RF transmission line should be matched at the transmitter end is to:

a. prevent frequency drift.
b. overcome fading of the transmitted signal.
c. ensure that the radiated signal has the intended polarization.
d. transfer the maximum amount of power to the antenna.

24. Damage to an antenna or feedline fed from the power amplifier of a transistor transmitter presents an incorrect load to the transmitter. The result is most likely to be that:

a. the driver stage will not deliver power to the final.
b. the output tank circuit breaks down.
c. excessive heat is produced by the final transistor.
d. there is loss of modulation in the transmitted signal.

25. One result of a slight mismatch between the power amplifier of a transmitter and the the antenna would be:

a. reduced antenna radiation.
b. radiation of key clicks.
c. lower modulation percentage.
d. smaller DC current drain.

26. If losses occur on a transmission line between transmitter and antenna:

a. less RF power will be radiated.
b. the SWR will not be 1:1.
c. reflections will occur in the line.
d. the wire will radiate RF energy.

27. A 75 ohm transmission line could be matched to a 300 ohm feedpoint of antenna:

a. with an extra 250 ohm resistor.
b. using a diode in one antenna leg.
c. using an antenna tuner.
d. if the antenna is suitably shortened.

28. The maximum power transfer from feedline to antenna occurs when:

a. the correct amount of power is applied.
b. their impedances are equal.
c. coaxial cable is used.
d. an SWR meter is placed in the feedline.

29. If the characteristic impedance of the feedline does not match the antenna input impedance then:

a. standing waves are produced in the feedline.
b. heat is produced at the junction.
c. the SWR drops to 1:1.
d. the antenna will not radiate any signal.

30. Which of the following will result from the presence of standing waves on a feeder:

a. maximum transfer of energy to the antenna from the transmitter.
b. perfect impedance match between transmitter and feedline.
c. reduced efficiency of transfer of RF to the antenna.
d. lack of radiation from the feedline.

31. When switching from receive to transmit:

a. the receiver should be muted.
b. the transmit oscillator should be off.
d. the antenna should be disconnected.
d. the power supply should be off.

32. A coaxial switch would be used to:

a. adjust and balance the feedline impedance to transmitter.
b. change the aerial feedline between transmitter and receiver.
c. bypass main circuit breaker.
d. measure SWR of aerial feedline.

33. A switching system to enable the use of one aerial with transmitter and receiver should also:

a. disable the unit not being used.
b. disconnect the aerial tuner.
c. ground the aerial on receive.
d. switch between meters.

34. An aerial changeover switch to enable a transmitter and receiver to use the one antenna should be located:

a. halfway along the feedline.
b. as near the aerial as possible.
c. near the transmitter and receiver.
d. before the power amplifier stage.

HIGH FREQUENCY ANTENNAS.

1. If a dipole transmitting aerial is orientated in a North to South direction, the greatest radiation will occur:

a. to the South.
b. to the South and North.
c. to the East and West.
d. equally in all directions.

2. At the end of suspended aerial wires insulators are used. These act to:

a. increase the effective aerial length.
b. limit the electrical length of the aerial.
c. allow the aerial to be more easily held vertically.
d. prevent any loss of radio waves by the aerial.

3. To lower the resonant length of an aerial, the operator should:

a. lengthen it.
b. centre feed it with TV ribbon.
c. shorten it.
d. earth one end.

4. A half-wave aerial is often called a:

a. bi-polar.
b. yagi.
c. dipole.
d. beam.

5. The resonant frequency of a dipole transmitting aerial is determined by:

a. its height above the ground.
b. its length.
c. the output power of the transmitter used.
d. the length of the transmission.

6. A suitable 28 MHz transmitting aerial for mounting on the mudguard of a car would be a:

a. vertical long wire.
b. quarter wave vertical.
c. horizontal dipole.
d. full wave centre fed horizontal.

7. For a particular frequency which of the following aerials would occupy the least space:

a. quarter wave
b. dipole
c. long wire
d. full wave vertical

8. An effective vertical aerial which utilizes a conductive surface at its base is the:

a. vertical dipole.
b. quarter wave ground plane.
c. aerial tuner.
d. long wire.

9. Most radiation from a vertical ground plane antenna is directed:

a. vertically upwards.
b. vertically downwards.
c. all around the aerial.
d. in a direction parallel to the feeder.

10. The main advantage of a vertical aerial is that it will:

a. require few insulators.
b. be very sensitive to signals coming from horizontal aerials.
c. receive signals from all points around it nearly equally.
d. easy to feed with TV ribbon feeder.

11. One reason a vertical antenna is suitable for mobile operation is that it:

a. is fed with balanced feedline.
b. radiates evenly in all horizontal directions.
c. is simpler to tune to frequency.
d. provides a better match to the transmitter.

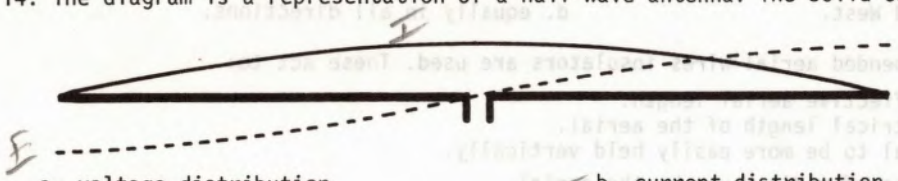
12. At the ends of a half-wave dipole:

a. voltage and current are both high.
b. voltage is high and current is low.
c. voltage and current are both low.
d. voltage low and current is high.

13. The impedance of a half-wave antenna at its centre is low because at this point:

a. voltage and current are both high.
b. voltage is high and current is low.
c. voltage and current are both low.
d. voltage is low and current is high.

14. The diagram is a representation of a half-wave antenna. The solid curved line represents:



a. voltage distribution.
b. current distribution.
c. impedance pattern.
d. radiation pattern.

15. The impedance at the centre of a dipole antenna many wavelengths above the ground would be nearest to:

a. 25 ohms.
b. 75 ohms.
c. 300 ohms.
d. 600 ohms.

16. A half-wave dipole is best fed at:

a. the ends with 75 ohm feedline.
b. the centre with 300 ohm feedline.
c. one end with 300 ohm feedline.
d. the centre with 75 ohm feedline.

17. A current and voltage distribution diagram of a vertical antenna gives an indication of:

a. match between feedline and aerial.
b. impedance at the feed point.
c. the SWR in the feedline.
d. the power output of the transmitter.

18. At the base of a quarter wavelength vertical ground plane antenna:

a. the voltage is low.
b. the current is low.
c. the impedance is high.
d. there is no radiation.

19. The diagram is a representation of a quarter wave vertical antenna. The dotted curved line represents:

a. impedance changes.
b. current distribution.
c. radiation pattern.
d. voltage distribution.

20. The base of a quarter wavelength ground plane vertical antenna is normally fed with:

a. 300 ohm balanced feedline.
b. 50 ohm coaxial cable.
c. 75 ohm balanced feedline.
d. 300 ohm coaxial cable.

21. Essentially, a dummy load is a:

a. power absorbing valve.
b. 'lossy' tuned circuit.
c. kind of resistor.
d. non radiating aerial.

22. To prevent radiation of radio frequency signals when testing a transmitter, use should be made of:

a. transmission line.
b. indoor antenna.
c. dummy load.
d. SWR meter.

23. A light globe could be useful as a dummy load:

a. if it radiated RF energy.
b. if it matched the feedline impedance.
c. as long as it did not glow.
d. if it had inductance.

24. The abbreviation SWR stands for:

a. signal width radiation.
b. signal with reflections.
c. standing wave ratio.
d. short wave receiver.

25. An instrument which is useful in checking whether RF power in the feedline is being transferred to the antenna is:

a. a standing wave ratio meter.
b. an antenna tuner.
c. a dummy load.
d. a keying monitor.

26. An SWR meter measures the degree of match between feedline and antenna by:

a. measuring radiated RF energy.
b. comparing forward and reflected voltage.
c. measuring the conductor temperature.
d. inserting a diode in the feedline.

27. An SWR meter gives an indication of:

a. the match between transmitter and feedline.
b. the radiation pattern of the antenna.
c. the gain of the antenna.
d. the match between feedline and antenna.

28. An SWR meter when used in an antenna feedline gives the most accurate indication of match between feedline and antenna:

a. closest to the antenna terminals.
b. exactly halfway between transmitter and antenna tuner.
c. closest to the transmitter output.
d. on the transmitter side of the antenna tuner.

29. A yagi antenna is said to have a power gain over a dipole antenna for the same frequency band because:

a. it radiates more power than a dipole.
b. more powerful transmitters can be used with it.
c. it radiates power in one general direction.
d. it can be used for more than one band.

30. In a three element yagi aerial the maximum radiation is:

a. in the direction of the reflector end of the beam.
b. in the direction of the director end of the beam.
c. at right angles to the beam.
d. parallel to the line of the co-ax feeder.

31. In a three element beam aerial the reflector and director(s) are called:

a. oscillators.
b. tuning stubs.
c. parasitic elements.
d. matching units.

32. A yagi antenna usually consists of a driven element and a reflector. Additional elements are called:

a. refractors.
b. feeders.
d. radiators.
d. directors.

33. In a three element beam the transmission line would be connected to the:

a. driven element.
b. director.
c. beam.
d. reflector element.

34. In a three element beam aerial the reflector should be:

a. the same length as the radiator.
b. slightly longer than the raditor.
c. shorter than the director.
d. shorter than the radiator.

35. By making the director shorter, and the reflector longer than the driven element in a beam antenna, the:

a. feedpoint impedance can be changed to 300 ohms.
b. signal can be directed mainly in one direction.
c. SWR on the feedline will be 1:1.
d. distance between elements can be shortened.

INTERFERENCE TO OTHER SERVICES

1. Spurious oscillations in a transmitter:

   a. occur on the crystal frequency.
   b. cause key clicks that can be received many miles away.
   c. reduce the standing wave ratio.
   d. could interfere with TV reception.

2. If an AM transmitter is modulated over 100%, which of the following could occur?

   a. certain amount of FM will occur in the oscillator
   b. overheating in the modulation transformer could damage it
   c. the PA stage would be de-neutralised
   d. new side frequencies produced widen the bandwidth greatly

3. Radiation of harmonics of the operating frequency of an amateur station is undesirable because of:

   a. damage to the RF stage of the receiver.
   b. burning of the changeover relay's contacts.
   c. interference to surrounding receiving equipment.
   d. distortion of the signal received on that frequency.

4. Evidence which would most strongly suggest that amateur transmissions are overloading audio frequency stages of a television receiver would be:

   a. interference occurs on one TV channel only.
   b. diagonal lines appear on the screen.
   c. the TV picture blacks out or loses colour.
   d. the voice transmission is heard on all TV channels.

5. To determine whether television interference is being caused either by harmonic radiation or severe overloading of the TV receiver's front end, the most useful course of investigation might be:

   a. see if some or all of the TV channels are affected.
   b. check the transmitter for harmonics.
   c. see whether TV sound or vision is affected.
   d. operate the transmitter into a dummy load.

6. Interference to television reception by harmonics of a transmitter could be identified as:

   a. small black-and white spots on the screen.
   b. a cause for a blown fuse in the receiver.
   c. evenly spaced diagonal lines on the screen.
   d. a weakening of the received signal.

7. Disappearance of television interference when the offending transmitter operates into a dummy load indicates that:

   a. the television receiver must be at fault.
   b. transmitter power leads should be filtered.
   c. the interference is transmitted via the aerial.
   d. another transmitter is causing the interference.

8. A "harmonic" is:

   a. the proper technical term used for "splatter".
   b. a frequency which is a simple multiple of the transmitted frequency.
   c. a frequency produced when two other frequencies are mixed.
   d. a sideband frequency produced by overmodulation.

9. Harmonics are produced when:

a. a resonant circuit is detuned.
b. negative feedback is applied to an amplifier.
c. a transistor is biased for class A operation.
d. a sine wave is distorted.

10. An interfering signal from a novice transmitter is found to have a frequency of 57.1 MHz (TV Ch 1 is 56 - 63 MHz). This signal could be:

a. seventh harmonic of an 80 metre transmission.
b. third harmonic of a 15 metre transmission.
c. second harmonic of a 10 metre transmission.
d. crystal oscillator operating on its fundamental.

11. Transmitter RF amplifiers can generate parasitic oscillations:

a. on the transmitter fundamental frequency.
b. on harmonics of the transmitter frequency.
c. on either side of the transmitter frequency.
d. on VHF frequencies only.

12. It is often possible to identify the presence of parasitics by investigating the power amplifier circuit leads with:

a. a torch globe. b. a neon lamp. c. an ammeter. d. an SWR meter.

13. Parasitic oscillations would tend to occur mostly in:

a. diode valves used as rectifiers.
b. high gain audio output stages.
c. in radio frequency output stages.
d. in silicon diodes and FETs.

14. A single band transmitter RF power amplifier which is generating parasitic oscillations:

a. will not emit less power at its tuned frequency.
b. will have two sets of tuned circuits.
c. will still only be heard on one frequency.
d. cannot be tuned for correct output.

15. Harmonics of the speech frequencies of an AM transmitter occur above and below the transmitter frequency when:

a. the transmission is unmodulated.
b. the transmission is overmodulated.
c. there is 50% modulation.
d. there is 100% modulation.

16. When an AM transmitter is overmodulated:

a. the amount of power in the modulated carrier does not change.
b. the transmitter is cut off during parts of the speech cycle.
c. the power amplifier goes into self-oscillation.
d. the transmission shifts in frequency.

17. Interference on frequencies adjacent to a transmitter's operating frequency would indicate:

a. a 100% modulated transmission.
b. a 50% modulated transmission.
c. an unmodulated transmission.
d. an overmodulated transmission.

18. Overmodulation of an AM transmitter will cause:

a. harmonics.
b. spurious radiation.
c. splatter.
d. parasitics.

INTERFERENCE TO OTHER SERVICES

19. When the signal from a transmitter overloads the audio stages of a broadcast receiver, the transmitted signal:

a. can appear wherever the receiver is tuned.
b. appears only when a station is tuned.
c. is distorted on voice peaks.
d. appears only on one frequency.

20. When transmitter interference can be tuned evenly across the dial of a broadcast receiver receiver it is most likely to be suffering from:

a. harmonic interference.
b. cross-modulation.
c. splatter.
d. overload.

21. Cross-modulation of a broadcast receiver by a nearby transmitter would be noticed in the receiver as:

a. interference continuously across the dial.
b. a signal heard on one or two frequencies only.
c. interference only when a broadcast signal is tuned.
d. distortion on transmitted voice peaks.

22. Cross-modulation of a broadcast receiver can occur due to:

a. rectification in an early stage.
b. harmonics of the transmitter.
c. detection in an audio stage.
d. overmodulation of the transmitter.

23. A band pass filter will:

a. pass frequencies each side of a band.
b. stop frequencies in a certain band.
c. only allow certain frequencies through.
d. attenuate high frequencies but not low.

24. A band stop filter will:

a. pass frequencies each side of a band.
b. stop frequencies each side of a band.
c. only allow certain frequencies through.
d. pass frequencies below 100 MHz.

25. A low pass filter suitable for a high frequency amateur transmitter would:

a. attenuate frequencies above 30 MHz.
b. pass frequencies below 100 MHz.
c. attenuate frequencies below 30 MHz.
d. pass frequencies above 100 MHz.

26. A 30 MHz low pass filter will only operate effectively if:

a. a high power transmitter is used.
b. the transmission line SWR is low.
c. a high pass filter is fitted to the television set.
d. a crystal oscillator is used in the transmitter.

27. Installing a low pass filter between transmitter and transmission line will:

a. permit higher frequency signals to pass to the antenna.
b. ensure an SWR not exceeding 2:1.
c. reduce the power output back to the legal maximum.
d. permit lower frequency signals to pass to the antenna.

28. A low-pass filter would be used in the aerial arrangement of an amateur transmitter:

a. to reduce key clicks developed in a CW transmitter.
b. to increase harmonic radiation.
c. to eliminate chirp in CW transmissions.
d. to reduce radiation of harmonics.

29. A low pass filter may be used in an amateur radio installation:

a. to attenuate signals lower in frequency than the transmission.
b. to attenuate signals higher in frequency than the transmission.
c. to boost the output power of the lower frequency transmissions.
d. to boost the power of higher frequency transmissions.

30. Television interference caused by harmonics radiated from an amateur transmitter could be eliminated by fitting:

a. a low pass filter in the TV receiver aerial input.
b. a high pass filter in the transmitter output.
c. a low pass filter in the transmitter output.
d. a band-pass filter to the speech amplifier.

31. The output coupling stage of a CW transmitter is necessary, not only to match it to the transmission line, but also:

a. to reduce harmonics always present in the output.
b. to reduce SWR due to antenna mismatch.
c. to prevent radiation of key clicks.
d. to prevent the oscillator from drifting.

32. Which of the following might be installed instead of a low pass filter to eliminate 7 MHz harmonics from a 3.5 MHz transmitter?

a. a wavemeter
b. an SWR meter.
c. a high pass filter.
d. a parallel tuned circuit.

33. A high pass filter is designed to:

a. prevent interference to broadcast reception.
b. prevent overmodulation in a transmitter.
c. prevent interference to TV reception.
d. pass a band of speech frequencies in a modulator.

34. A high pass filter would normally be fitted:

a. between transmitter output and feedline.
b. at the antenna terminals of the TV receiver.
c. at the morse key or keying relay in a transmitter.
d. between microphone and speech amplifier.

35. A high pass filter attenuates:

a. a band of frequencies in the VHF region.
b. low frequencies but not high frequencies.
c. all except a band of VHF frequencies.
d. high frequencies but not low frequencies.

TEST EQUIPMENT AND MEASUREMENTS

1. Which of the following meters would you use to measure the power supply current drawn by a small hand-held transistorised receiver?

a. a moving iron meter
b. an RF ammeter
c. a moving coil meter
d. an electrostatic voltmeter.

2. Fullscale deflection (FSD) on a moving coil meter is usually measured in terms of:

a. current.
b. resistance.
c. ohms/volt.
d. volts.

3. Sensitivity of a moving coil meter is measured in:

a. ohms/volt.
b. volts/ohm.
c. amps/volt.
d. volts/amp.

4. The most accurate estimate of the voltage across a resistor carrying current could be made with:

a. a high impedance voltmeter.
b. a low impedance voltmeter.
c. a moving iron meter.
d. a thermocouple meter.

5. When measuring current drawn by a light bulb on a DC supply, it is true to say that the meter will act in circuit as:

a. an insulator.
b. a low value resistance.
c. a perfect conductor.
d. an extra current drain.

6. When measuring the current drawn by a receiver from a power supply, the current meter should be placed:

a. in parallel with both receiver power supply leads.
b. in parallel with one of the receiver power leads.
c. in series with both receiver power leads.
d. in series with one of the receiver power leads.

7. A meter with a low internal resistance would tend to:

a. make less accurate voltage readings.
b. be useless for measuring DC current.
c. be difficult to adapt to make AC readings.
d. be sensitive to lower currents.

8. It is necessary to monitor a lower current than possible with the type of meter at hand. To do this one would have to:

a. add a resistor in series.
b. use the meter by itself.
c. add a resistor in parallel.
d. use another more sensitive meter.

9. To make a meter with a 10 mA FSD read 20 mA FSD, use is made of:

a. resistor in series.
b. a resistor in parallel.
c. a capacitor in parallel.
d. another 10 mA meter in series.

10. A DC moving coil meter is used to measure DC current when:

a. a resistor is used in series with the meter.
b. a resistor is used in parallel with the meter.
c. a transformer is used.
d. a diode is used.

11. A meter set to its current range should never be put:

a. across battery terminals.
b. in series with another meter.
c. in series with a resistor.
d. in series to measure current.

12. In order to convert a milliamp meter to measure high voltage DC it is necessary to place a:

a. resistor in series with the meter.
b. resistor in parallel with the meter.
c. rectifier in series with the meter.
d. capacitor in parallel with the meter.

13. When measuring an unknown DC voltage with a multi-range meter you should first use:

a. the lowest current range.
b. the high voltage scale.
c. the resistance range.
d. the lowest AC voltage range.

14. A meter with low sensitivity, that is with low internal resistance:

a. underestimates voltage drops.
b. is generally more accurate.
c. is more easily damaged.
d. is usually more expensive.

15. When using a meter of low sensitivity to measure the voltage across a resistor, the reading will always be lower than the true voltage, because, with reference to the resistor:

a. the meter is a resistance in parallel with it.
b. the meter forms a voltage divider with it.
c. such meters are always inaccurate.
d. the meter forms a series string resistance.

16. When measuring the voltage drop across a resistor the voltmeter should be placed:

a. in parallel with the resistor.
b. in series with the resitor.
c. in place of the resistor.
d. across the battery in circuit.

17. Before using a multimeter as an ohmmeter the user should:

a. check readings against standard resistors,
b. short the leads and adjust to full scale.
c. remove the batteries.
d. remove the leads and adjust for zero resistance.

18. The extra components necessary to use a moving coil meter to measure resistance are:

a. diode and battery.
b. resistor and diode.
c. resistor and battery.
d. capacitor and resistor.

19. When a moving coil meter is used as an ohmmeter, the angle the meter moves from its position when it was disconnected is:

a. greater with lower resistances.
b. lower with lower resistances.
d. greater if more sensitive.
d. greater with greater resistance.

20. When a moving coil meter is used as an ohmeter, it is measuring:

a. voltage across the ends of the resistor.
b. current in parallel with the internal resistor.
c. the decrease in series current with resistor inserted.
d. the internal resistance of the meter's battery.

21. A device which uses the same meter movement to measure voltage, current, and resistance is called a:

a. moving iron meter.
b. a multimeter.
c. moving coil meter.
d. voltmeter.

22. A DC voltmeter is to be used to measure an AC voltage. To accomplish this, one must add a:

a. resistor in series.
b. resistor in parallel.
c. choke in series.
d. diode in series.

23. You wish to fit a moving coil DC voltmeter to your power supply to measure the mains voltage. How would you connect it into the primary circuit for this purpose?

a. with a resistor in series
b. with a diode in series
c. with a capacitor in parallel
d. with a resistor in parallel

24. Which meter would be cheapest to instal and most suitable for measuring a 50 Hz alternating current of 15 amperes?

a. moving coil meter
b. moving iron meter
c. moving coil meter with series diode
d. meter with series diode and choke

25. When checking the exact frequency of a crystal marker oscillator with a general coverage receiver:

a. the receiver's frequency markings can be taken as exact.
b. a standard frequency station should be tuned.
c. another crystal marker oscillator should be used.
d. a dip oscillator could be used as a standard.

26. When using a crystal marker oscillator to calibrate a receiver's frequency:

a. the beat frequency oscillator should be on.
b. the volume control should be reduced to zero.
c. the local oscillator should be disabled.
d. the RF gain control should be at zero.

27. Which of the following devices would give the most accurate indication of frequency?

a. a second receiver
b. a dip oscillator
c. a crystal marker oscillator
d. a beat frequency oscillator

28. A crystal marker oscillator using a 1 MHz crystal could be used to:

a. identify the frequency of 1 MHz only, on a receiver.
b. locate a frequency of 500 kHz.
c. locate any frequencies 1 MHz apart, on a receiver.
d. locate frequencies which are simple multiples of 1 MHz.

29. A dip oscillator is used by itself for measuring:

a. the resistance of a resistor.
b. the inductance of an inductor.
c. mutual inductance.
d. resonant frequency.

30. The resonant frequency of a coil and capacitor connected in parallel may be determined by using:

a. a wavemeter.
b. a dip oscillator.
c. a frequency meter.
d. a field strength meter.

31. When measuring the resonant frequency of a tuned circuit with a dip oscillator it is essential that:

a. the tuned circuit is not energised.
b. the two frequencies are not the same.
c. radio frequency current flows in the tuned circuit.
d. the dip oscillator is not oscillating.

32. Resonance is indicated on a dip oscillator used to measure a tuned frequency when:

a. its capacitor has the same value as that on the tuned circuit.
b. energy is lost to the circuit being checked.
c. both coils have the same number of turns.
d. the meter needle indicates a sudden increase.

33. With the aid of a set of standard capacitors, a dip oscillator could be used to measure:

a. capacitance. b. inductance. c. resistance. d. voltage.

34. DC input power of a transmitter is:

a. the total power consumed by the transmitter.
b. less than the RF power output.
c. the power consumed by the final power amplifier.
d. the power dissipated in a dummy load.

35. The DC input power of a transmitter is:

a. the same as the RF power output.
b. always less than the RF power output.
c. the sum of anode/collector dissipation and RF output.
d. the difference between the RF output and anode/collector dissipation.

36. The difference between DC input power and RF output power of a transmitter RF amplifier:

a. is radiated from the antenna. b. appears as heat dissipation.
c. is lost in the feedline. d. is due to oscillating current.

37. The equipment necessary to measure the DC input power of a transmitter includes:

a. an ammeter and voltmeter. b. a separate power supply.
c. a dummy load and RF voltmeter. d. an SWR meter.

38. A valve transmitter power amplifier draws 30 mA of current, at a plate voltage of 300 volts. The DC input power is therefore:

a. 300 watts. b. 9 000 watts. c. 9 watts. d. 6 watts.

39. The DC input power of a transistor transmitter operating at 12 volts and drawing 500 milliamps in the power would be:

a. 6 watts. b. 12 watts. c. 20 watts. d. 500 watts.

40. Which instrument combination could be used to measure the power output of a transmitter?

a. signal generator and dip oscillator. b. DC ammeter and voltmeter
c. oscillator and rectifier bridge. d. dummy load and RF voltmeter

41. A well-designed dummy load should be able to;

a. reflect completely all signals fed to it.
b. convert all RF signals to heat.
c. have an infinite SWR.
d. present half the impedance as the antenna being used.

42. To prevent radiation of RF when a transmitter is run for lengths of time:

a. the feedline should be disconnected from the transmitter.
b. the transmitter should be connected to a dummy load.
c. the antenna should be disconnected from the feedline.
d. a shielded meter should be placed across the output terminals.

43. The relative power output from a transmitter into a dummy load could be measured efficiently:

a. with a multimeter. b. using a light globe.
c. using a receiver. d. using an RF voltmeter.

44. An SWR meter, correctly placed in an antenna feedline reads 1:1. This means that:

a. antenna impedance is the same as that of the feedline.
b. power reaching the antenna terminals is being reflected.
c. 50% of power reaching the antenna is being radiated.
d. no power is being lost at the power amplifier.

45. An SWR meter as well as indicating match between feedline and an antenna, can be used to indicate:

a. relative power output.
b. the changes necessary to correct it.
c. resistances of components.
d. resonant frequencies.

46. When a perfect impedance match is achieved between feedline and antenna, one would expect the SWR meter to give a reading of;

a. over 10:1 ratio.
b. 60 dB over S-9.
c. 52 ohms exactly.
d. a 1:1 ratio.

47. An SWR meter is used in a transmission line to compare the voltage levels of signals:

a. in aerial and transmitter.
b. in aerial and feedline.
c. travelling in opposite directions in feedline.
d. travelling in feedline for modulation level.

48. To calibrate an SWR meter one must first adjust:

a. forward energy reading to full scale.
b. reflected energy reading zero.
c. the SWR to 3:1.
d. forward energy to a minimum.

49. When adjusting transmitting station equipment using an SWR meter you should aim to achieve:

a. a 5;1 ratio.
b. a 10;1 ratio.
c. the lowest possible ratio.
d. the highest possible ratio.

50. The indication given on the face of a cathode ray oscilloscope represents:

a. a comparison of two voltages.
b. a ratio of current to voltage.
c. a ratio of frequency to time.
d. changes of voltage with time.

51. The vertical scale of a cathode ray oscilloscope gives indications of:

a. voltage.
b. current.
d. frequency.
d. time.

52. The horizontal scale of a cathode ray oscilloscope gives indications of:

a. voltage.
b. current.
c. amplitude.
d. time.

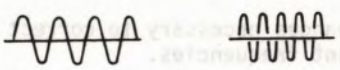
53. The cathode ray oscilloscope shown is attached to pick up signals from an AM transmitter. The figure shows that:

a. the frequency of the signal is changing.
b. the amplitude of the signal is changing.
c. the transmitter is cut off at intervals.
d. the signal is unmodulated.

54. To observe clearly a higher frequency audio signal on the face of a cathode ray oscilloscope one should increase:

a. the sweep rate.
b. the sweep width.
c. the input resistance.
d. the voltage sensitivity.

55. The two wave forms shown are observed on a cathode ray oscilloscope screen



A B

a. B has higher amplitude than A.
b. A has higher frequency than B.
c. A has higher amplitude than B.
d. B has higher frequency than A.

REGULATIONS.

1. With respect to the Amateur Service an Amateur Radio Operator using his station "without pecuniary interest" must not:

   a. pay more than the prescribed rate of interest on money borrowed to establish his Station.
   b. make profit or financial gain by the reception and transmission of messages from his Station.
   c. make any profit or financial gain by selling equipment used in Amateur Stations.
   d. be engaged in a vocation in Radio, Electronics or Communications.

2. An AMATEUR STATION is a radio station which is:

   a. licensed to operate in the Amateur frequency bands by the Australian Department of Post and Telecommunications.
   b. owned and operated by a person who is not engaged professionally in Radio Communications.
   c. used exclusively to provide two-way Radio communications in connection with activities of amateur sporting organisations.
   d. used primarily for emergency communications in floods, bushfires and similar disaster situations.

3. The difference between PORTABLE and MOBILE STATIONS is that:

   a. Portable Stations are lower powered (no more than 10 watts on CW and 30 watts on Sideband) than Mobile Stations.
   b. Portable stations are operated while the transporting vehicle is in motion.
   c. Portable Stations are not operated while the transporting vehicle is in motion.
   d. Mobile Stations must not be used for Morse Code transmissions.

4. When a licensed Amateur Radio Operator operates on a 2 metre transceiver while driving his vehicle, he is using a:

   a. portable vehicular station.
   b. mobile Amateur Station.
   c. mobile-mobile Citizens Radio Service station.
   d. Car-phone service station.

5. An amateur radio operator is asked by his office manager to pass a business message to another Amateur Station. The Amateur should;

   a. agree to handle the message for the same monetary rate as the Postal department.
   b. agree to handle the message, but accept no payment.
   c. refuse to handle the message under any circumstance.
   d. handle the message, but warn the manager he is liable for any penalty.

6. Which of these callsigns would relate to a radio station in the Broadcasting Service?

   a. VK2HF. b. VIS. c. NAB271. d. 2FC.

7. With respect to two-way contacts between two Amateur Stations, the term "Third Party" refers to:

   a. a person other than the two Amateur operators.
   b. a third Amateur operator joining the contact.
   c. an unlicenced operator supervised by an Amateur Operator.
   d. an operator on the frequency, unaware that it is in use.

8. The Australian Government Department responsible for administration of the Wireless Telegraphy Act is the:

   a. Attorney-General's Department.
   b. Department of the Air.
   c. Department of Science.
   d. Department of Post and Telecommunications.

9. What age limits apply for issue of Novice Operator's Certificates and Novice Station Licences?

a. no age limit b. over 12 years c. over 15 years d. over 18 years

10. What is the maximum fine applicable for convictions for unlicenced Radio transmitting?

a. up to 40 dollars
b. up to 100 dollars
c. not exceeding 500 dollars
d. not exceeding 1000 dollars for each offence

11. At which age can the holder of an AOCP or AOLCP qualification be granted an Amateur Station Licence?

a. no age limit. b. over 12 years c. over 15 years d. over 18 years

12. Which is the lowest frequency band available for use by AOLCP (Limited) holders?

a. 28.0 to 29.70 MHz
b. 52 to 54 MHz
c. 144 to 148 MHz
d. 420 to 450 MHz

13. When applying external heart massage to an adult how many compressions per minute should be applied?

a. 15 b. 30 c. 60 d. 120

14. Candidates for Morse Code tests at "full" AOCP examinations must pass at a speed of:

a. 5 wpm. b. 7 wpm. c. 10 wpm. d. 12 wpm.

15. After passing the appropriate examination a certificate will be issued on presentation of details of:

a. amateur transmitter, secrecy declaration and citizenship.
b. secrecy declaration, proposed antenna and signed photo.
c. citizenship, secrecy declaration and examination mark.
d. personal particulars, secrecy declaration and signed photo.

16. In the AOCP Morse Code receiving test, passes are awarded to candidates who make no more than:

a. 4. b. 7. c. 9. d. 10 errors.

17. In the event of an amateur station licence being mutilated or damaged the licencee should:

a. make written application, including the damaged licence for free replacement.
b. retain the damaged licence and make written application a new one, sending $6.
c. make written application including damaged licence and cheque for $6.
d. retain the damaged licence and make written application for free replacement.

18. The morse code speed (in words per minute) to be attained by Novice Amateur Certificate candidates is:

a. 10. b. 8. c. 7. d. 5.

19. In the morse code receiving test Novice candidates may be granted passes if their errors total no more than:

a. 4. b. 7. c. 8. d. 10.

20. Which of the following actions should a Novice Licensee take before operation from an Air Force establishment?

a. Inform the Superintendent, Regulatory and Licensing Section, P and T Department.
b. Seek written approval from the Command Headquarters.
c. He should restrict operating times and bands as required by the Commanding Officer.
d. He should obtain verbal permission from the establishment commanding officer.

21. Before an Amateur Operator can operate his station on an Australian Registered ship at sea he must:

a. submit application to the Department accompanied by written permission of the ship's captain.
b. Inform the Department in writing of such intention to operate.
c. Use the ship's callsign instead of his own.
d. use his own and the ship's callsign together.

22. If an Amateur Operator does not wish to renew his Station licence, he should:

a. inform the Department in writing and return the licence.
b. return the station licence and Amateur operator's certificate to the nearest PO.
c. take no action whatever.
d. post the station licence to the Minister for Post and Telecommunications.

23. Operators of mobile Amateur Radio Stations must:

a. carry photostated copies of Amateur licence and certificate.
b. apply for a second copy of the Amateur licence.
c. indicate the station callsign clearly on the vehicle.
d. carry the original station licence in the vehicle.

24. In the absence of an Amateur operator from his home station:

a. the station may be used by his family.
b. the station may not be used by any unlicensed person.
c. he may maintain communication with his family if the station callsign is used by both stations.
d. he must obtain a separate mobile licence to communicate with his family at the house station.

25. In which of these Amateur bands are television image experiments permitted?

a. 1800 to 1860 kHz.
b. 420 to 450 MHz.
c. 28.0 to 29.70 MHz.
d. 144 to 148 MHz.

26. The abbreviation "PEP" means:

a. producing extra potential.
b. plus emergency position.
c. parasitic elimination provision.
d. peak envelope power.

27. To which transmitting mode does the symbol "F3" refer?

a. facsimile with direct carrier modulation.
b. four channel multiplex telegraphy.
c. frequency modulation using speech.
d. phase modulated telegraphy.

28. Which of the following symbols represents "unmodulated telegraphy" or CW?

a. A1
b. F2
c. A3
d. A4

29. Which of the following Amateur Bands would not be classed as a High Frequency (HF) band?

a. 1800 to 1860 kHz
b. 3.5 to 3.7 MHz
c. 7.00 to 7.15 MHz
d. 28.00 to 29.70 MHz

30. Segments of the three Amateur bands authorised for Novice operations are located in:

a. three medium frequency bands.
b. one medium frequency and two high frequency bands.
c. three high frequency bands.
d. two high frequency and one very high frequency bands.

31. Which of the following segments represent the Novice allocation in the "80 meter band"?

a. 21.125 to 21.200 MHz
b. 80 to 82 meters
c. 28.1 to 28.6 MHz
d. 3.525 to 3.625 MHz

32. On which of the following bands would the holder of an AOLCP qualification NOT be authorised to operate?

a. 28.00 to 29.70 MHz
b. 144 to 148 MHz
c. 52 to 54 MHz
d. 420 to 450 MHz

33. Which of the following signals are radiated by an "A3J emission"?

a. a carrier and two sidebands
b. one sideband and no carrier.
c. two sidebands and no carrier
d. lower sideband and carrier

34. Holders of AOCP qualifications may operate their stations in CW mode at input power of:

a. up to 50 watts.
b. up to 150 watts.
c. up to 400 watts.
d. up to 1000 watts.

35. Which of the following power authorisations for CW and SSB apply to Novice station transmissions?

a. 15 watts input for CW and 50 watts for SSB
b. 10 watts output for CW and 30 watts PEP for SSB
c. 14 watts output for CW and 30 watts PEP for SSB
d. 4 watts input for CW and 12 watts for SSB

36. To determine the PEP (Peak Envelope Power) of his SSB transmitter, an Amateur Radio Operator should apply:

a. a square wave to the transmitter.
b. a sinusoidal waveform to the transmitter.
c. two non-harmonically related sinusoidal tones of equal amplitude to the transmitter.
d. two harmonically related sinusoidal tones of equal amplitudes to the transmitter.

37. A Novice radio operator is informed that his transmissions are causing interference to a neighbour's TV. The first action the Novice should take is to:

a. cease transmission except for brief tests to determine corrective measures.
b. cease transmission and immediately notify a Radio Inspector.
c. continue transmission until fault in transmitter is rectified.
d. continue transmission until fault in TV is rectified.

38. Before erecting a tower on which to mount an aerial, an Australian Amateur Radio Operator must:

a. obtain permission in writing from the Officer-in-Charge of the nearest Police Station.
b. obtain approval in writing from the nearest District Radio Inspector.
c. obtain verbal or written permission from the Superintendent of the Radio Branch in the nearest capital city.
d. submit plans and engineering specifications to the Engineer of the local Shire or Municipal council.

39. Which of the following Amateur bands is often called "the 15 metre band"?

a. 1800 to 1860 kHz
b. 21.00 to 21.45 MHz
c. 14.00 to 14.35 MHz
d. 28.00 to 29.70 MHz

40. Which of the following frequency segments should NOT be used by Novice amateur licensees?

a. 3.525 to 3.625 MHz
b. 21.125 to 21.200 MHz
c. 7.100 to 7.150 MHz
d. 28.100 to 28.600 MHz

41. Which of the following frequency bands is not authorised for use by Australian Amateur Radio licensees?

a. 25.100 to 25.300 MHz
b. 3.5 to 3.7 MHz
c. 28.00 to 29.70 MHz
d. 1800 to 1860 kHz

42. A novice CW transmitter with a valve in the Power amplifier stage has a high tension supply of 250 volts and a plate current of 40 milliamperes. Is this transmitter operating:

a. well above the authorised power.
b. slightly above the authorised power.
c. exactly on the authorised power.
d. within the authorised power.

43. Which of the following Test Instruments is used in the determination of "Peak Envelope Power" of an amateur transmitter utilising "A3J" type of emission?

a. a wavemeter
b. an RF current meter
c. a heterodyne frequency meter
d. a 0-250 m/A DC moving coil meter

44. If you find a person lying on a workshop floor still in contact with a "live" wire, which of the following steps would you take FIRST?

a. commence "mouth to mouth" artificial respiration
b. proceed with heart massage immediately
c. remove the "live" wire from contact with the victim
d. apply "mouth to mouth" respiration and external heart massage simultaneously

45. What power may be used by an Australian Amateur operator of AOCP qualifications when using the A3J speech mode?

a. 150 watts PEP
b. 400 watts PEP
c. 500 watts PEP
d. 1000 watts PEP

46. The symbol "A3J" represents:

a. amplitude modulated telephony
b. radio teletype telegraphy.
c. single sideband suppressed carrier.
d. double sideband suppressed carrier telephony.

47. The permitted bandwidth for F3 speech signals transmitted from an HF amateur station is:

a. plus or minus 7 000 hertz.
b. plus or minus 3 000 hertz.
c. plus or minus 1 000 hertz.
d. plus or minus 5 MHz.

48. Which of the following Amateur stations would be identified by the callsign VK2NNN/3?

a. a Victorian Novice station portable or mobile in New South Wales
b. A New South Wales Novice station calling a station in Victoria
c. a New South Wales Novice station portable or mobile in Victoria
d. a Victorian Novice station calling a station in New South Wales

49. Which of the following callsigns would identify a Queensland Novice station?

a. VK6NTL
b. VK4NZZ
c. VK4ANY
d. VK5ZBX

50. When an Amateur station re-transmits a tape recording of another station's transmission back to that station, the transmitting station must announce his own callsign:

a. before such re-transmission.
b. after such re-transmission.
c. before and after re-transmission, including the other station's callsign in the recording.
d. before and after re-transmission deleting the other station's callsign in the recording.

51. Which of the following callsigns would identify a Novice Amateur operator in Tasmania?

a. VK7NT b. VK7ANY c. VK7NBX d. VK7ZNN

52. The penalty which applies to an Amateur radio operator who fails to comply with the Regulations governing the operation of Amateur stations is:

a. $1000. b. $500. c. $100. d. $40.

53. Which of the following would not be acceptable to the Australian Department of Post and Telecommunications under normal conditions?

a. A contact between a Novice station and a Citizens Radio station on 27 MHz
b. A contact between a Novice station and a Station operated by the holder of an AOCP qualification
c. A contact between a small ship station and a station operated by a Novice operator under emergency conditions
d. A contact between an amateur station and a state emergency service station during an earthquake disaster situation

54. Which of the following is indicated by the use of the callsign "VK2YFC"?

a. the licensee holds only NAOCP qualifications
b. the station is not in the amateur service
c. the licensee holds an AOLCP
d. the VK2Y--" callsigns are reserved for licensed amateurs who are members of yachting clubs

55. In each Australian state the "on-air" operations of the amateur service are supervised by:

a. the amateur service disciplinary council.
b. the National Radio Spectrum Advisory Committee.
c. the Federal Communication Commission.
d. the Amateur Advisory Committee.

56. Provided annual licence renewal fees are paid, the holder of a Novice amateur certificate may hold a Novice station licence for:

a. one year only. b. two years only. c. five years only. d. any period.

57. Where would amateur station VK8BX normally be located:

a. Tasmania. b. Norfolk Island. c. Northern Territory. d. Antarctica.

58. Which amateur callsign prefix refers to amateur stations in the Australian Capital territory?

a. VK1 b. VK2 c. VK3 d. VK9

59. Which of the following forms should a novice operator use when making test transmissions in morse code?

a. "CQ CQ CQ de VK2NNN"
b. "XXX XXX XXX de VK2NNN"
c. "VVV VVV VVV de VK2NNN"
d. "VK2NNN testing.

60. Before an amateur radio operator makes a brief test transmission, he should:

a. check that the frequency is not already in use.
b. ensure that the test does not exceed one minute.
c. give his station callsign at least every ten minutes.
d. fit an artificial aerial to the transmitter.

61. Which of the following documents need not be shown to a Radio inspector during an inspection of an amateur radio station?

a. Station Log Book
b. Amateur Operator's Certificate of Proficiency
c. Amateur Station Licence
d. Statutory Declaration regarding Secrecy of Wireless Communication

62. On which special frequency would a ship station be authorised to transmit a distress call and message by radiotelegraphy?

a. 2410 kHz b. 3.525 MHz c. 500 kHz d. 27.065 MHz

63. The signal "XXX XXX XXX de VNHS" sent by morse code represents:

a. a distress signal from an aircraft.
b. an urgency signal from a ship station.
c. a general call prior to a weather report.
d. a final call for assistance before a ship sinks.

64. If an amateur radio operator is in a situation where, to save his own life and/or the lives of other people, he must transmit a DISTRESS SIGNAL by morse code, which of the following would he send?

a. PAN b. MAYDAY c. CQD d. SOS

65. The Distress signal "SOS" is:

a. an abbreviation for "save our souls".
b. an abbreviation for "save our ship".
c. merely a distinctive morse code signal with no specific meaning.
d. an abbreviation for "safety of shipping"

66. A distress call by telephony would feature the word:

a. PAN. b. EMERGENCY. c. HELP. d. MAYDAY

67. On hearing an unanswered distress call on 146 MHz from a mobile amateur operator reporting a serious motor accident, a Novice operator should:

a. reply to the mobile operator on 3.5 MHz.
b. write the details into the station logbook and report the incident to the police.
c. write the details in his station logbook but take no further action.
d. transmit an "SOS" call on all novice frequencies and repeat the information in the distress call.

68. When a visiting novice operator operates the station of an operator holding the AOCP, the novice operator under supervision should use:

a. the station owner's callsign.
b. his own callsign.
c. both callsigns.
d. the station owner's callsign with the suffix"/N".

69. An amateur operator may operate a mobile portable station away from his home address without notifying the radio frequency management division for:

a. at least 7 days.
b. no more than 3 days.
c. up to 48 hours.
d. up to 5 consecutive days.

70. What Q signal should be sent as an instruction to a station to cease transmitting?

a. QRK?
b. QRT
c. QSX
d. QUM

71. Which of the following transmitting modes would be most likely to produce "key clicks"?

a. A3H
b. F2
c. A3J
d. A1

72. If an Australian amateur radio operator sends "CQ DX" while making a general call, he:

a. wishes to contact a German amateur station.
b. invites reply from members of a DX club.
c. expects a reply from local amateur operators.
d. is not interested in calls from local radio amateurs.

73. Which of the following items is NOT required for inclusion in an amateur station logbook?

a. date and time of each transmission
b. names and addresses of stations worked
c. frequencies on which contacts have been made
d. modes of transmission used

74. The Q code signal "QRV" means:

a. "are you ready?"
b. "I am about to send a test signal".
c. "please send a series of Vs".
d. "your signals are fading".

75. The urgency signal sent by morse code would indicate that:

a. a ship has received no replies to its distress call and is now sending urgency signals.
b. that an amateur mobile station wishes to report a prolonged traffic hold up.
c. that a station has an urgent message concerning the safety of a ship or person.
d. that an aircraft is about to make a crash landing.

76. A distress call sent in morse code would be transmitted in the form:

a. CQ CQ CQ de VHMUZ VHMUZ VHMUZ.
b. XXX XXX XXX de VHMUZ VHMUZ VHMUZ.
c. CQD CQD CQD de VHMUZ VHMUZ VHMUZ.
d. SOS SOS SOS de VHMUZ VHMUZ VHMUZ.

77. Which of the following amateur callsigns should not be heard on the 7 MHz band?

a. VK2NER
b. VK8MK
c. VK2YA
d. VK6LC

78. When making prolonged test transmissions on high frequency bands, an amateur radio operator must:

a. use an artificial aerial.
b. not use more than 10 watts.
c. use a directional aerial.
d. give the station callsign every 30 seconds.

79. The operation of station VK2NMW has just made a CQ call. Operator of VK2AKH wishes to establish communication with him. Which is the correct form for him to call VK2NMW?

a. "commencing signal VK2NMW VK2NMW VK2NMW de VK2AKH VK2AKH VK2AKH QSA 5 K"
b. "commencing signal VK2NMW VK2NMW VK2NMW de VK2AKH VK2AKH VK2AKH QRZ 5 K"
c. "VK2NMW de VK2AKH K"
d. "VK2NMW VK2NMW de VK2AKH QRA QRZ K"

80. The "Q" code signal "QSL" means:

a. "your frequency is varying".
b. "your signals are unreadable".
c. "you may resume normal working.
d. "I acknowledge receipt".

81. Which of the following usages of the Phonetic Alphabet would be most acceptable when spelling out the word MAGPUBS?

a. MAYDAY ALPHA GEORGE PETER UNITED BAKER SUGAR
b. MIKE ALPHA GOLF PAPA UNIFORM BRAVO SIERRA
c. MELBOURNE ADELAIDE GRAFTON PAN UNIFORM BRISBANE SYDNEY
d. MICHEGAN ATLANTA GEORGIA PENNSYLVANIA URGENCY BALTIMORE SEATTLE

82. The "Q" code is intended:

a. for use in emergency communications only.
b. to reduce the length of radio telephony transmissions.
c. to increase the speed of morse code communications.
d. to help maintain secrecy of wireless communications.

83. What would the signal "QRQ 15" mean?

a. "Please stand by. I shall call you again in 15 minutes".
b. "I am moving my transmitting frequency 15 kHz higher to avoid interference".
c. "Please increase your Morse sending speed to 15 words a minute".
d. "Your transmitting frequency is 15 kHz higher (or lower) than mine".

84. The meaning of the signal "QRW VK2NZZ 3562?" is:

a. "Please inform VK2NZZ that I am calling him on 3562 kHz."
b. "Shall I inform VK2NZZ that you are calling him on 3562 kHz?"
c. "Are you listening to VK2NZZ on 3562 kHz?"
d. "Do you know that VK2NZZ is calling you on 3562 kHz?"

85. Which of the following "Q code" signals means "WHO IS CALLING ME"?

a. QRQ? b. QRS? c. QRK? d. QRZ?

86. Which of the following "Q code" signals means "SHALL I CHANGE TO TRANSMISSION ON ANOTHER FREQUENCY"?

a. QRZ? b. QRG? c. QRH? d. QSY?

87. Under difficult communication conditions which "Q code" signal would you send to request "PLEASE SEND EACH WORD MORE THAN ONCE"?

a. QSZ? b. QRZ? c. QRS d. QSZ

88. What is the meaning of the signal "QSO VK5FM?"?

a. "have you any message for VK5FM?"
b. "are you receiving interference from VK5FM?"
c. "can you communicate with VK5FM?"
d. "are you monitoring signals from VK5FM on this frequency?"

89. During a CW contact, which "Q code" signal would you transmit to find out if the other operator is experiencing interference from another station?

a. QSV? b. QRH? c. QTH? d. QRM?

90. Which of the following gives the meaning of the "Q code" signal "QRN?"?

a. "What is the exact time?"
b. "Are you troubled by static?"
c. "I am suffering from interference":
d. "Shall I cancel the last message received?"

91. What does "QRU?" mean in a Morse code transmission?

a. "Have you anything for me?" b. "I have nothing for you".
c. "Are you ready?" d. "What is my exact frequency?"

92. If the operator of a station with which you are in communication sends "QSB" in morse code, he means:

a. that YOUR signals are fading. b. that HIS signals are fading.
c. that atmospherics are making reception difficult. d. that a nearby station is causing interference.

93. Which of the following does "QRS 7" mean?

a. "I am calling a Tasmanian station"
b. "Please reduce your sending speed to 7 words a minute"
c. "I am receiving your signals at strength 7"
d. "I shall reduce power to 7 watts"

94. Which Q code signal would be used to inform another station that his signals vary in frequency?

a. QRG b. QRZ c. QRH d. QRQ

95. The signal "QRQ?" means:

a. "Shall I send faster?" b. "Who is calling me?"
c. "Shall I resume normal working?" d. "Does my frequency vary?"

96. The morse code signal "QSY 3575" means:

a. "Please handle emergency traffic on 3575 kHz"
b. "Change to transmission on 3575 kHz"
c. "Your exact transmitting frequency is 3575 kHz"
d. "Send a series of V's on 3575 kHz"

97. The function of the Amateur Adivsory Committees in each state is:

a. to apprehend and prosecute unlicensed persons transmitting on authorised Amateur service bands.
b. to take disiplinary action against amateur operators who fail to observe satisfactory operating standards.
c. to maintain satisfactory standards of operating on amateur bands.
d. to organise instructional courses for enthusiasts wishing to qualify as amateur radio operators.

98. After a member of an Amateur Advisory Committee observes an Amateur transmission contrary to departmental regulations, the committee would.

a. issue a notification to the offending station.
b. report the sub-standard transmission to the department.
c. authorise impounding of the station's equipment.
d. issue a closing order on the station.

99. An Australian amateur radio operator wishes to travel to a European country and operate his station "portable-mobile" there. If Australia has reciprocal licensing arrangements with that country, then he should:

a. obtain an International Radio Licence from the International Telecommunications Union.
b. expect to receive a licence when he arrives in that country.
c. operate under his Australian callsign.
d. apply in writing to the licensing authority in that country.

100. An amateur operator wants another station to check his exact transmitting frequency. He should send the "Q code" signal:

a. QRG ? b. QRH? c. QSA d. QRK

TRIAL THEORY AND REGULATION EXAMS

NOVICE AMATEUR OPERATOR'S TRIAL EXAM

SUBJECT: THEORY

INSTRUCTIONS TO CANDIDATES: Time allowed - ONE HOUR
Answer all questions
A pass will be awarded to candidates who record 35 or more correct answers. (70%)

1. A resistor of value 110 kilohms is required but none is available. The most suitable replacement combination would be:

   a. two 220 kilohm resistors in series.
   b. three 47 kilohm resistors in series.
   c. two 220 kilohm resistors in parallel.
   d. two 68 kilohm resistors in parallel.

2. How well a coil will oppose AC depends on:

   a. resonance.
   b. "Q" factor.
   c. conductance.
   d. inductance.

3. Which of the following expressions is correct about current, voltage and resistance:

   a. $E = IR$.
   b. $I = ER$.
   c. $R = EI$.
   d. $E = I^2R$.

4. The most accurate estimate of the voltage across a resistor carrying current could be made with:

   a. a high impedance voltmeter.
   b. a low impedance voltmeter.
   c. a moving iron meter.
   d. a thermocouple meter.

5. When soldering a small component, the lead is often held with pliers or a copper clamp between the body of the component and the joint being soldered. This is to:

   a. prevent dangerous voltages destroying the component.
   b. increase the lead length to the joint.
   c. prevent heat damage to the component.
   d. increase the conductivity of the soldered joint.

6. The most suitable type of capacitor to filter AC ripple from the output of a power supply would be:

   a. an air dielectric capacitor.
   b. an electrolytic capacitor.
   c. a plastic film capacitor.
   d. a mica capacitor.

7. The microfarad is a unit of:

   a. resistance.
   b. inductance.
   c. reactance.
   d. capacitance.

8. The resistance of a resistor labelled red-violet-orange would be:

   a. 273 Ω
   b. 27 kΩ
   c. 27 000 kΩ
   d. 37 kΩ

9. Removal of the ferrite core from a coil in a tuned circuit:

   a. decreases the tuned frequency.
   b. decreases the capacitance.
   c. increases the tuned frequency.
   d. increases the capacitance.

10. The material with the highest resistance in this list is:

    a. copper.
    b. silver.
    d. lead.
    d. carbon.

11. A circuit needs a voltage of 2 volts applied to it. A convenient source of EMF would be a:

    a. Nicad cell
    b. torch battery.
    c. lelanche cell.
    d. lead acid cell.

12. The primary function of diodes generally is to allow:

a. voltage regulation.
b. control of oscillators.
c. variable resistance effects.
d. one way conduction.

13. The diagram represents:

a. an NPN transistor.
b. a PNP transistor.
c. an NPN FET
d. a PNP FET

14. A transistor is specified as having a high "beta" value. This refers to the transistor's:

a. power rating.
b. current gain.
c. dopant
d. PIV.

15. A solid state amplifying device with a very high input impedance is the:

a. bipolar transistor.
b. dipolar diode.
c. field effect transistor.
d. pentode valve.

16. To help keep the transistor junction within its correct operating temperature range use is made of a:

a. temperature controlled soldering iron.
b. thermal fuse.
c. heat sink.
d. electric fan.

17. For a pentode to act as an effective amplifier the:

a. plate must be more negative than the cathode.
b. cathode must be more negative than the plate.
c. grid must be made as positive as the plate.
d. grid and cathode must be equally negative.

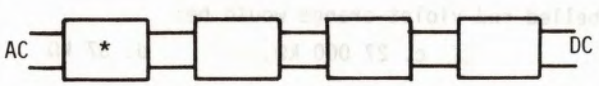
18. An amplifier with feedback which is positive over a band of frequencies will:

a. prove a sensitive audio amplifier.
b. act as an oscillator at those frequencies.
c. form a balanced modulator at that frequency.
d. act as a SSB generator.

19. When an amplifier is being run in "class C", reference is being made to:

a. the amateur band being used.
b. audio quality of its output.
c. DC bias in the amplifier.
d. the power input to the final amplifier.

20. The stage marked * in the block diagram of an AC operated power supply is:



a. rectifier.
b. transformer.
c. filter capacitor.
d. voltage stabilizer.

21. A receiver operating from a power supply develops an objectionable 50 Hz hum. Which stage of the power supply is likely to be at fault?

a. switch
b. transformer
c. filter
d. fuse

22. A voltage of 120 volts at 100 milliamps is to be drawn from a transformer with a 240 volt primary. The amount of current drawn in the primary is closest to:

a. 1 amp.
b. 500 milliamps.
c. 200 milliamps.
d. 50 milliamps.

23. A solid state voltage regulating device used in a power supply is the:

a. varicap diode.
b. triode valve.
c. electrolytic capacitor.
d. zener diode.

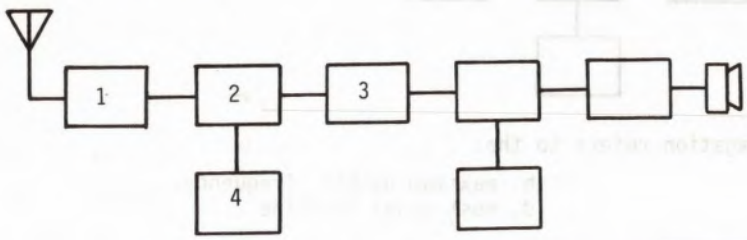
24. A stage has an input signal of 1 195 kHz and an output of 3.585 MHz. The stage is a:

a. oscillator.
b. tripler.
c. doubler.
d. linear.

25. A transmitter operating on 3.550 MHz is producing two other signals designated X & Y of frequencies 3.572 and 7.100 MHz respectively. A correct description of these two signals is:

	X	Y
a.	overload	parasitic
b.	parasitic	overload
c.	parasitic	harmonic
d.	harmonic	parasitic

26. In the diagram representing a superheterodyne receiver the section representing the IF amplifier would be:



a. 1.
b. 2.
c. 3.
d. 4.

27. An incoming signal at a receiver is 3.505 MHz. For an output at the IF of 455 kHz the local oscillation output frequency must be;

a. 455 kHz.
b. 3.110 MHz.
c. 3.050 MHz.
d. 458.565 MHz.

28. The stage of a receiver which acts to simulate the presence of a carrier to enable effective detection is the:

a. IF amplifier.
b. AF amplifier.
c. BF oscillator.
d. IF oscillator.

29. The process of imparting speech information to a carrier signal is known as;

a. detection.
b. resonance.
c. enveloping.
d. modulation.

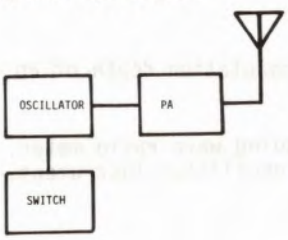
30. When tuning with a very selective receiver a signal is received which seems to have a very small bandwidth and occupies only a spot frequency. Such a signal could be a:

a. carrier.
b. sideband.
c. double sideband.
d. modulated sideband.

31. To fully high level modulate a 10 watt carrier signal the audio power supplied must be:

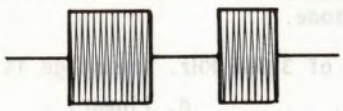
a. 1 watt.
b. 5 watts.
c. 10 watts.
d. 50 watts.

32. The block diagram represents:



a. AM phone transmitter.
b. DSB phone transmitter.
c. SSB phone transmitter.
d. CW transmitter.

33. The diagram shows a possible waveform from a CW transmitter. Such a wave would generate interference known as:

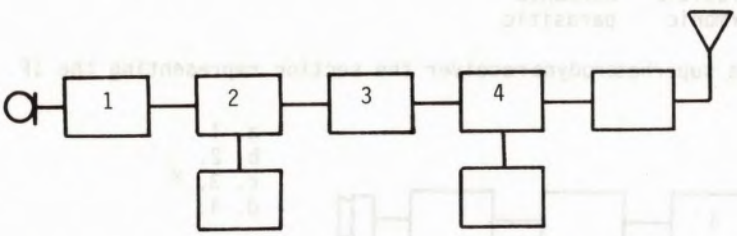


a. wave form distortion.
b. key clicks.
c. parasitic interference.
d. overload interference.

34. A basic unit in an SSB transmitter is a:

a. diode detector.
b. class C amplifier.
c. balanced modulator.
d. dipole aerial.

35. The block diagram represents an SSB transmitter, The HF mixer is stage:



a. 1.
b. 2.
c. 3.
d. 4.

36. The MUF for radio wave propagation refers to the;

a. most used frequency.
b. maximum usable frequency.
c. magnetic uniform field.
d. most usual feedline.

37. Radio waves are:

a. sound waves.
b. electron waves.
c. electromagnetic waves.
d. conic waves.

38. The ionosphere appreciably increases the reception range of many HF radio signals since these signals are:

a. refracted back to earth by the ionosphere.
b. polarized by the ionosphere.
c. absorbed by the ionosphere.
d. multiplied in amplitude by the ionosphere.

39. Coaxial line used in Novice stations is often quoted as 50 ohms. This indicates the line's:

a. maximum power capability.
b. characteristic impedance.
c. likely energy loss.
d. upper frequency limit.

40. Many transmitter-receiver combinations have a relay which operates when the press to talk switch is released. As well as switching the aerial from the transmitter to receiver this relay will:

a. short the continuing transmitter output to earth.
b. short the receiver input to earth.
c. prevent transmitter final stage from operating.
d. prevent receiver final stage from operating.

41. An instrument that could give a quick check of the modulation depth of an AM transmitter is:

a. cathode ray oscilloscope.
b. standing wave ratio meter.
c. marker crystal tester.
d. dip oscillator instrument.

42. A moving coil meter is rated at 1 mA 10 mV. If it has a low value resistor connected across its terminals it could be classed as:

a. I ampere FSD. b. 1 volt FSD. c. 1 ohm FSD. d. 1 farad FSD.

43. The test instrument used to indicate the resonant frequency of a tuned circuit is the;

a. marker crystal, b. dip oscillator.
c. audio oscillator. d. moving coil meter.

44. A measurement which compares forward transmitted voltage signal to reflected voltage signal in an aerial feedline is termed:

a. standing wave ratio. b. aerial impedance factor.
c. natural aerial resonance value. d. parasitic signal level.

45. An effective artificial aerial (dummy load) could be constructed using a:

a. dipole aerial rolled into a coil. b. quarter wavelength of coaxial cable.
c. non-inductive power resistor. d. high voltage filter capacitor.

46. The length of a dipole antenna for the HF band indicates its operating:

a. voltage. b. current. c. power. d. frequency.

47. To prevent a Novice transmitter generating harmonic interference in a nearby TV receiver the transmitter could be fitted with a:

a. high pass filter in the mains power leads.
b. low pass filter in the mains power leads.
c. high pass filter in the aerial feedline.
d. low pass filter in the aerial feedline.

48. A TV receiver in a weak reception area experiences interference from a nearby amateur transmitter on all TV channels at near equal strength. This type of interference is best described as:

a. receiver overload. b. transmitter overload.
c. receiver splatter. d. transmitter splatter.

49. The circuit shown depicts a:

a. series combination of resistor and variable capacitor.
b. parallel combination of inductance and variable resistance.
c. series combination of inductance and variable capacitor.
d. parallel combination of inductance and variable capacitor.

50. The prefix milli means:

a. 1 000 000. b. 1 000. c. 0.000 001. d. 0.001.

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

NOVICE AMATEUR OPERATOR'S TRIAL EXAM

SUBJECT: REGULATIONS

INSTRUCTIONS TO CANDIDATES: Time allowed - THIRTY MINUTES
Answer all questions
A pass will be awarded to candidates who record 21 or more correct answers. (70%)

1. The morse code signal SOS is sent by a station which:

   a. has an urgent business message.
   b. is reporting grave and imminent danger to life.
   c. makes a report regarding a shipping hazard.
   d. is sending important weather information.

2. Where transmission of a distress signal is not justified, the urgency signal, in morse code, which should be sent, includes:

   a. XXX XXX XXX.
   b. MAYDAY MAYDAY MAYDAY.
   c. PAN PAN PAN.
   d. CQD CQD CQD.

3. The frequency 500 KHz is reserved for:

   a. distress calls in voice from aircraft.
   b. urgency calls in morse code from aircraft.
   c. distress calls in morse code from ships.
   d. urgency calls in voice from ships.

4. The need for external heart massage on an electrocuted person would be shown most clearly by:

   a. arrested breathing.
   b. loss of pulse in the neck.
   c. the person's loss of consciousness.
   d. disappearance of the wrist pulse.

5. When applying external heart massage to a patient whose heart has stopped beating, pressure should be applied to:

   a. whole of the chest.
   b. lower half of the breastbone.
   c. solar plexus.
   d. breastbone between the shoulders.

6. The call sign VK4NZZ would identify a:

   a. limited callstation in Victoria.
   b. full call station in South Australia.
   c. limited call station in New South Wales.
   d. novice call station in Queensland.

7. A New South Wales novice station operating portable in South Australia would use the callsign:

   a. VK5NXX/2. b. VK5NXX. c. VK2NXX/5. d. VK2NXX.

8. A licensee holding the Amateur Operator's Limited Certificate of Proficiency would be identified by the callsign:

   a. VK2YFT. b. VK4NRO. c. VK3ZN. d. VK5YY.

9. Which of the following frequency bands is outside an Amateur allocation in Australia?

a. 3.525 to 3.625 MHz
b. 28.100 to 28.600 MHz
c. 7.00 to 7.15 MHz
d. 50.00 to 52.00 MHz

10. The morse code signal "QRZ?" means:

a. "I am ceasing transmission"
b. "are my signals fading"
c. "what is the name of your station?"
d. "who is calling me?"

11. The morse code signal "QRT" means:

a. "normal working may now be resumed"
b. "can you acknowledge receipt?"
c. "I have nothing for you"
d. "stop sending"

12. The morse code signal "QSZ" means:

a. "send each word or group more than once"
b. "you are being called by .... on .... MHz"
c. "shall I change to transmission on another frequency?"
d. "are you ready?"

13. The message "shall I send faster?" is indicated by the Q-code signal:

a. QRS
b. QRQ?
c. QRV
d. QSA?

14. The Q-code signal sent in morse code to indicate to a station that his signals are fading is:

a. QSY?
b. QSB
c. QRX
d. QRM?

15. The signal "have you anything for me?" is sent in morse Q-code as:

a. QRU?
b. QRH
c. QSL?
d. QRZ?

16. A request to a station to reduce his morse code sending speed to 7 words per minute, would be indicated by the Q-code signal:

a. QRQ7
b. QRS7
c. QRV?
d. QRG

17. When an Amateur Radio Operator does not desire to renew his licence he is required to advise the Department and:

a. destroy the licence.
b. retain the licence.
c. return the licence.
d. receive a refund.

18. Which documents must be made available to the inspecting officer during an inspection of his station?

a. log book, licence and examination results
b. certificate, log book and licence
c. certificate, licence and secrecy declaration
d. licence, log book and QSL cards

19. At the age of 12, having passed the necessary requirements, a person would be eligible to hold

a. all classes of Amateur Licence.
b. Novice and Limited Licence only.
c. Novice and Full Licence.
d. Novice Licence only.

20. Of the following communications from an amateur station, which is operating within the terms of his licence?

a. technical investigations with 11-metre emergency stations.
b. the transmitting of a telephone link on amateur bands.
c. technical communication with other amateur stations.
d. fast-scan television images on 28.0-29.7 MHz.

21. The restrictions of 10 watts output on CW and AM modes and 30 watts PEP for SSB apply to:

a. operation by limited and novice licensees.
b. operation by novice licensees.
c. operation by all classes of amateur licensees.
d. operation by limited licensees.

22. The maximum peak envelope power (in watts) allowable to Amateurs holding AOCP certificates is:

a. 30. b. 50. c. 150. d. 400.

23. An A3 transmission would radiate

a. carrier and two sidebands. b. one sideband and no carrier.
c. two sidebands and no carrier. d. lower sideband and carrier.

24. Before an Amateur Operator erects a tall aerial mast approval should be given by the:

a. Post and Telecommunications Department.
b. Local Government Authorities.
c. Electrical Supply Authorities.
d. Australian Broadcasting Control Board.

25. Requests for replacement of lost or mutilated licences should be forwarded to:

a. Postal and Telecommunications Department.
b. Telecom Australia.
c. the local Post Office.
d. the Government Printer.

26. Novice licensees are authorised to operate on the frequencies:

a. 1.80 to 1.86 MHz. b. 7.00 to 7.15 MHz.
c. 21.125 to 21.200 MHz. d. 26.960 to 27.230 MHz.

27. Before making a test transmission on the air, an Amateur operator should:

a. fit an artificial antenna.
b. listen on the proposed frequency.
c. tune the transmitter correctly.
d. inform all other stations on the frequency.

28. Before operating in a portable or mobile capacity for an extended period an Amateur operator should:

a. purchase a mobile/portable licence.
b. apply in writing to the Department in his State.
c. inform the nearest Radio Inspector by telephone.
d. take no action whatsoever.

29. Peak envelope power of an SSB transmitter should be determined using an appropriate resistive dummy load, and a suitable RF current meter, and apply to the input:

a. a stable sinusoidal audio tone.
b. a square wave signal.
c. two non-harmonically related tones.
d. 400 watts of input power.

30. When transmitting, an Amateur Operator is required to transmit the station call-sign at the beginning and end of the session and

a. every five minutes during the session.
b. no other identification is necessary.
c. every ten minutes during the session.
d. whenever another operator is about to transmit.

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

ANSWERS

ELECTRICAL LAWS AND CIRCUITS

Electricity and electric currents

1-a	2-d	3-a	4-c	5-d	6-c	7-b	8-c	9-b	10-d
11-b	12-b	13-a	14-d	15-c	16-a	17-d	18-c	19-d	20-b
21-b	22-c	23-c	24-b	25-b					

Direct current

1-a	2-b	3-a	4-c	5-b	6-b	7-a	8-a	9-c	10-b
11-d	12-d	13-c	14-b	15-a	16-c	17-d	18-c	19-a	20-a
21-d	22-a	23-d	24-c	25-d	26-a	27-b	28-c	29-d	30-d
31-a	32-b	33-b	34-a	35-b	36-d	37-c	38-d	39-a	40-d
41-a	42-b	43-c	44-d	45-b	46-d	47-c	48-b	49-d	50-b
51-d	52-b	53-a	54-d	55-c	56-a	57-d	58-c	59-a	60-c
61-c	62-b	63-c	64-c	65-c	66-c	67-b	68-a	69-d	70-b
71-d	72-d	73-a	74-d	75-a	76-c	77-b	78-b	79-a	80-b
81-d	82-d	83-a	84-d	85-c	86-b	87-a	88-d	89-c	90-c
91-c	92-d	93-b							

AC circuits

1-d	2-b	3-d	4-b	5-c	6-b	7-c	8-b	9-a	10-d
11-b	12-c	13-c	14-d	15-a	16-b	17-d	18-a	19-a	20-a
21-c	22-c	23-c	24-a	25-c	26-d	27-c	28-c	29-c	30-a
31-d	32-a	33-b	34-a	35-b	36-a	37-d	38-c	39-d	40-d
41-b	42-d	43-b	44-b	45-a	46-b	47-a	48-b	49-d	50-a
51-d	52-b	53-c	54-b	55-d	56-c	57-c	58-c	59-a	60-b
61-d	62-b	63-c	64-d	65-d	66-b	67-d	68-d	69-b	70-a
71-d	72-c	73-b	74-d	75-b	76-d	77-b			

VACUUM TUBE PRINCIPLES

The Thermionic Valve

1-a	2-a	3-c	4-d	5-b	6-c	7-a	8-c	9-c	10-a
11-a	12-b	13-a	14-c	15-c	16-a	17-a	18-b	19-a	20-d
21-c	22-b	23-d	24-a	25-d	26-c	27-a	28-c	29-b	30-b
31-b	32-b	33-c	34-c	35-b	36-b	37-d	38-c	39-d	40-c
41-c									

Amplification

1-d	2-c	3-b	4-a	5-c	6-a	7-b	8-d	9-b	10-c
11-b	12-c	13-b	14-b	15-a	16-a	17-c	18-c	19-a	

SEMICONDUCTOR DEVICES

The Diode

1-b	2-c	3-a	4-a	5-b	6-d	7-b	8-b	9-c	10-b
11-c	12-b	13-c	14-c	15-c	16-d	17-b	18-d	19-c	20-c
21-c	22-d	23-a	24-d	25-b					

Bipolar and Field Effect Transistors

1-b	2-c	3-b	4-b	5-a	6-c	7-d	8-b	9-d	10-a
11-a	12-c	13-d	14-a	15-b	16-c	17-b	18-a	19-a	20-d
21-b	22-d	23-d	24-c	25-a	26-a	27-b	28-a	29-c	30-c
31-b	32-b	33-c	34-b	35-d	36-d	37-c	38-c	39-b	40-b
41-c	42-c	43-a	44-b	45-a	46-b	47-d	48-b	49-d	50-c

AC OPERATED POWER SUPPLIES

1-b	2-b	3-a	4-d	5-a	6-c	7-c	8-a	9-d	10-a
11-b	12-c	13-b	14-c	15-d	16-a	17-a	18-c	19-b	20-b
21-b	22-a	23-b	24-c	25-b	26-c	27-a	28-d	29-b	30-b
31-b	32-c	33-c	34-c	35-a	36-d	37-a	38-d	39-b	40-a
41-a	42-b	43-d	44-c	45-d	46-c	47-a	48-a	49-b	50-d
51-d	52-a	53-d	54-b	55-b	56-c	57-d	58-d	59-c	60-a
61-d	62-d	63-a	64-a	65-b	66-c	67-b	68-c	69-d	70-a
71-c	72-d	73-c	74-a	75-a	76-c	77-b	78-d	79-c	80-a

HF TRANSMITTERS

1-a	2-a	3-a	4-c	5-b	6-d	7-b	8-b	9-a	10-a
11-d	12-c	13-a	14-c	15-b	16-a	17-a	18-b	19-a	20-b
21-a	22-c	23-d	24-a	25-b	26-c	27-d	28-a	29-b	30-b
31-a	32-d	33-a	34-b	35-c	36-a	37-a	38-d	39-a	40-a
41-b	42-c	43-d	44-c	45-d					

RECEIVING SYSTEMS

1-a	2-b	3-c	4-c	5-c	6-b	7-d	8-c	9-c	10-d
11-c	12-a	13-a	14-d	15-d	16-d	17-d	18-a	19-a	20-d
21-a	22-d	23-c	24-a	25-d	26-b	27-b	28-d	29-b	30-c
31-c	32-d	33-c	34-a	35-b	36-d	37-b	38-b	39-a	40-b
41-b	42-a	43-b	44-b	45-d	46-b	47-b	48-a	49-b	50-c
51-a	52-a	53-a	54-d	55-b	56-c	57-c	58-a	59-c	60-c
61-c	62-d	63-d	64-a	65-b	66-c	67-b	68-a	69-a	70-c

1000 QUESTIONS FOR NOVICE LICENCE CANDIDATES

AMPLITUDE MODULATION

1-a	2-b	3-b	4-a	5-c	6-b	7-d	8-c	9-d	10-a
11-a	12-c	13-b	14-b	15-c	16-a	17-c	18-b	19-d	20-c
21-d	22-c	23-d	24-d	25-d	26-b	27-a	28-b	29-a	30-d
31-b	32-a	33-a	34-d	35-a	36-b	37-c	38-c	39-a	40-a

CODE TRANSMISSION

1-c	2-a	3-b	4-b	5-c	6-a	7-d	8-b	9-d	10-c
11-a	12-a	13-b	14-c	15-b	16-c	17-b	18-b	19-b	20-a
21-b									

SINGLE SIDEBAND TRANSMISSION

1-b	2-c	3-a	4-b	5-d	6-d	7-c	8-c	9-d	10-c
11-a	12-d	13-d	14-b	15-b	16-c	17-b	18-d	19-b	20-b
21-d	22-b	23-a	24-d	25-b					

WAVE PROPAGATION

1-b	2-a	3-c	4-b	5-c	6-a	7-a	8-a	9-a	10-a
11-c	12-c	13-c	14-d	15-c	16-c	17-c	18-d	19-d	20-d
21-d	22-d	23-d	24-a	25-b	26-d	27-b	28-d	29-a	30-d
31-a	32-b	33-a	34-d	35-a	36-b	37-c	38-b	39-c	40-a
41-c	42-a	43-d	44-c	45-c	46-b	47-b	48-a	49-d	50-c

TRANSMISSION LINES

1-a	2-c	3-a	4-d	5-b	6-b	7-c	8-c	9-d	10-b
11-c	12-b	13-b	14-d	15-c	16-a	17-c	18-c	19-b	20-d
21-c	22-b	23-d	24-c	25-a	26-a	27-c	28-b	29-a	30-c
31-a	32-b	33-a	34-c						

HIGH FREQUENCY ANTENNAS

1-c	2-b	3-a	4-c	5-b	6-b	7-a	8-b	9-c	10-c
11-b	12-b	13-d	14-b	15-b	16-d	17-b	18-a	19-d	20-b
21-b	22-c	23-b	24-c	25-a	26-b	27-d	28-a	29-c	30-b
31-c	32-d	33-a	34-b	35-b					

INTERFERENCE

1-d	2-d	3-c	4-d	5-a	6-c	7-c	8-b	9-d	10-c
11-c	12-b	13-c	14-b	15-b	16-b	17-d	18-c	19-a	20-d
21-c	22-a	23-c	24-a	25-a	26-b	27-d	28-d	29-b	30-c
31-a	32-d	33-c	34-b	35-b					

TEST EQUIPMENT AND MEASUREMENTS

1-c	2-a	3-a	4-a	5-b	6-d	7-a	8-d	9-b	10-b
11-a	12-a	13-b	14-a	15-a	16-a	17-b	18-c	19-a	20-c
21-b	22-d	23-b	24-b	25-b	26-a	27-c	28-d	29-d	30-b
31-a	32-b	33-b	34-c	35-c	36-b	37-a	38-c	39-a	40-d
41-b	42-b	43-d	44-a	45-a	46-d	47-c	48-a	49-c	50-d
51-a	52-d	53-b	54-a	55-d					

REGULATIONS

1-b	2-a	3-c	4-b	5-c	6-d	7-a	8-d	9-a	10-d
11-c	12-b	13-c	14-c	15-d	16-b	17-a	18-d	19-d	20-b
21-a	22-a	23-d	24-b	25-b	26-d	27-c	28-a	29-a	30-c
31-d	32-a	33-b	34-b	35-b	36-c	37-a	38-d	39-b	40-c
41-a	42-d	43-b	44-c	45-b	46-c	47-b	48-c	49-b	50-d
51-c	52-d	53-a	54-c	55-d	56-d	57-c	58-a	59-c	60-a
61-d	62-c	63-b	64-d	65-c	66-d	67-b	68-a	69-d	70-b
71-d	72-d	73-b	74-a	75-c	76-d	77-a	78-a	79-a	80-d
81-b	82-c	83-c	84-b	85-d	86-d	87-d	88-c	89-d	90-b
91-a	92-a	93-b	94-c	95-a	96-b	97-c	98-a	99-d	100-a

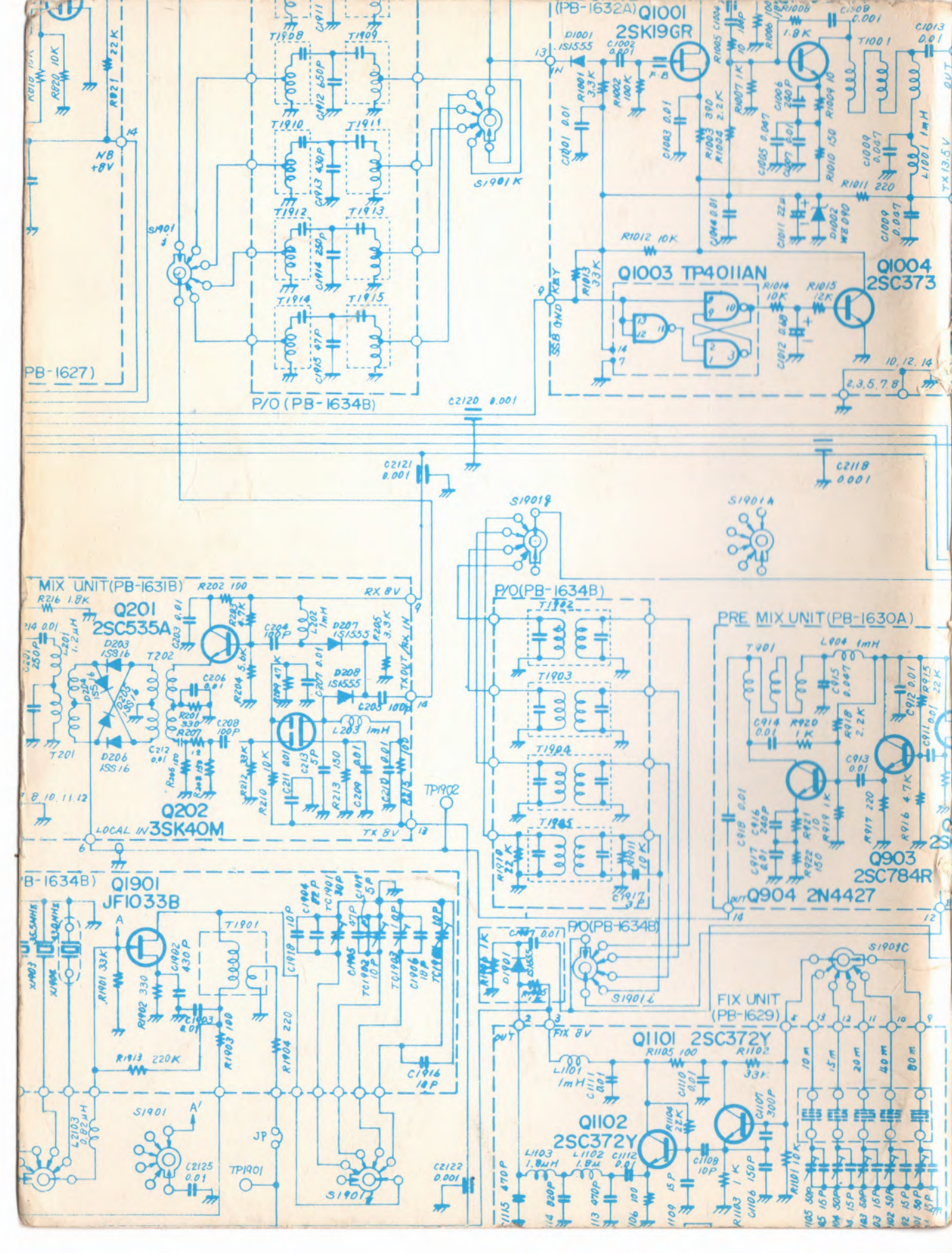
TRIAL THEORY AND REGULATION EXAMS

Theory Exam

1-c	2-d	3-a	4-a	5-c	6-b	7-d	8-b	9-c	10-d
11-d	12-d	13-b	14-b	15-c	16-c	17-b	18-b	19-c	20-b
21-c	22-d	23-d	24-b	25-c	26-c	27-c	28-c	29-d	30-a
31-b	32-d	33-b	34-c	35-d	36-b	37-c	38-a	39-b	40-c
41-a	42-a	43-b	44-a	45-c	46-d	47-d	48-a	49-d	50-d

Regulations Exam

1-b	2-a	3-c	4-b	5-b	6-d	7-c	8-a	9-d	10-d
11-d	12-a	13-b	14-b	15-a	16-b	17-c	18-b	18-d	20-c
21-b	22-d	23-a	24-b	25-a	26-c	27-b	28-b	29-c	30-a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Q1001
2SK19GR
Q1003 TP4011AN
Q1004
2SC373
Q1101 2SC372Y
Q1102
2SC372Y
P/O (PB-1634B)
PB-1627)
MIX UNIT(PB-1631B)
Q201
2SC535A
Q202
3SK40M
P/O(PB-1634B)
PRE MIX UNIT(PB-1630A)
Q903
2SC784R
Q904 2N4427
P/O(PB-1634B)
Q1901
JF1033B
FIX UNIT
(PB-1629)
NB
+8V
RX 8V
TX 8V
LOCAL IN
SSB GND
KEY
TX 13.5V